

7 Options for mitigating the impact in the UK

The demands and uncertainties associated with an influenza pandemic require flexible plans based on a combination of strategies to develop an effective and sustainable response. Medical or pharmaceutical countermeasures, combined with public health and personal infection control initiatives, and the possible application of measures to reduce social mixing, form the basis of the UK's mitigation strategy. The Government will need to make final decisions and issue advice on the application of additional measures or the scaling back of applied measures, as the exact nature or impact of the emerging strain of influenza virus becomes evident. Public support and compliance with infection control and other measures will be critical to the success of that strategy.

7.1 International travel, border restrictions and screening

International travel is increasingly central to world commercial, economic and recreational activity, and significant or lengthy interruptions have a range of disruptive effects. The movement of people is also a significant determinant of the speed of spread of infectious diseases, and as a major destination and international travel hub, the UK is particularly vulnerable.

Although the imposition of restrictions on travel to and from affected areas has made an important contribution to the control of some infectious diseases in the past, modelling and evidence from previous outbreaks of infectious diseases suggest that no practical level of travel restriction is likely to allow a country to avoid a pandemic altogether. However, modelling does suggest that the imposition of restrictions on all travel to the UK is likely to delay the arrival of the virus by one or two weeks if measures were 90% effective, and by some two months if 99.9% effective.

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.

The UK also needs to strengthen port health vigilance and develop capacity to implement any recommendations or restrictions, including entry or exit screening, that may be issued by the World Health Organization (WHO), the European Union (EU) or other governments. As an integral part of their preparation, port and airport operators, carriers and those authorities with

specific responsibility for port health should therefore review their arrangements for screening individuals with suspected illness on arrival, protecting their staff and rapidly implementing wider entry or exit control measures if required.

Advice to British nationals intending to travel to, or in, affected countries would be available from the Foreign and Commonwealth Office (FCO) and on government and Health Protection Agency (HPA) websites.

7.2 Pre-pandemic vaccination

Pre-first wave immunisation with an influenza vaccine related but not specific to the pandemic strain might offer some limited, but nonetheless useful, protection. Currently, the UK has very limited stocks of an A/H5N1 vaccine purchased specifically for the protection of healthcare workers. Pre-pandemic vaccination would be initiated based on national and international expert advice and delivery would primarily be the responsibility of employers.

Given sufficient additional stocks, a suitable vaccine could be used to provide partial protection for other workers likely to be frequently exposed to symptomatic patients or key staff crucial to the maintenance of essential services. Pre-pandemic vaccination of those most likely to spread the disease or suffer complications could also help reduce hospitalisations and deaths in vulnerable groups. Decisions on use would need to follow assessments of the likely degree of cross-protection afforded (if any) and a balance of risks against benefits as the pandemic alert phases change.

More widespread immunisation with a pre-pandemic vaccine could have a substantial effect, but this would require large stocks of such a vaccine and is not currently part of the UK health departments'/directorate's plans. Anticipating a suitable vaccine strain also has the inherent risk of it being ineffective against the ultimate pandemic strain. The Department of Health will continue to monitor the evolution of viral strains and options for pre-pandemic vaccination and will inform planners of any policy changes. In the meantime, response plans should assume that arrangements for limited pre-pandemic vaccination of targeted groups might become necessary.

7.3 Isolation, voluntary quarantine and social distancing

Whilst it might be possible to isolate initial cases and quarantine their immediate contacts, such an approach will become unsustainable after the first few hundred or so cases. Geographic quarantining measures ('cordons sanitaires') have been used in an attempt to isolate affected communities in the past, but are unlikely to be effective against pandemic influenza in the UK as infection is expected to affect all major population centres within one to two weeks of initial cases being identified.

Whilst those without symptoms will be encouraged to carry on as normal, symptomatic patients will be asked to stay at home or in their place of residence (voluntary home isolation and quarantine) whilst ill. If, in exceptional situations, staying at home becomes impossible, for example because of the need to be transferred to hospital, symptomatic patients should wear a disposable face mask to reduce transmission of infection.

Influenza is likely to spread rapidly in closed establishments such as prisons, residential homes and boarding schools where people are in close contact and where they may also be in higher-risk groups. Such establishments may also be more vulnerable to higher levels of staff absence, supply disruption or transport difficulties. As opportunities for closure, quarantine, isolation or social distancing may be limited, it is vital that resilient arrangements are developed in advance of an outbreak.

7.4 Antiviral medicines

Although the targeted and effective use of antiviral medicines or other definitive pharmaceutical interventions is an important countermeasure, they may be in limited supply. When used to treat seasonal influenza, antiviral medicines reduce the length of symptoms (by around a day) and usually their severity, as long as they start to be taken within two days of the onset of symptoms. Whilst it is impossible to predict whether antiviral medicines will be equally effective against a new or modified pandemic virus, it is reasonable to anticipate a similar effect and associated substantial reductions in severe morbidity.

The UK has established national stockpiles of oseltamivir (Tamiflu) – a neuraminidase inhibitor that works by preventing the influenza virus from reproducing and leaving the host cell. The existing stockpiles allow for the treatment of all symptomatic patients at clinical attack rates of up to 25% and arrangements to make it rapidly available are a critical part of the health response. Although a number of alternative strategies are also being evaluated, scientific advice confirms that prompt treatment of all symptomatic patients is currently the most effective use of the antiviral stocks available. Higher clinical

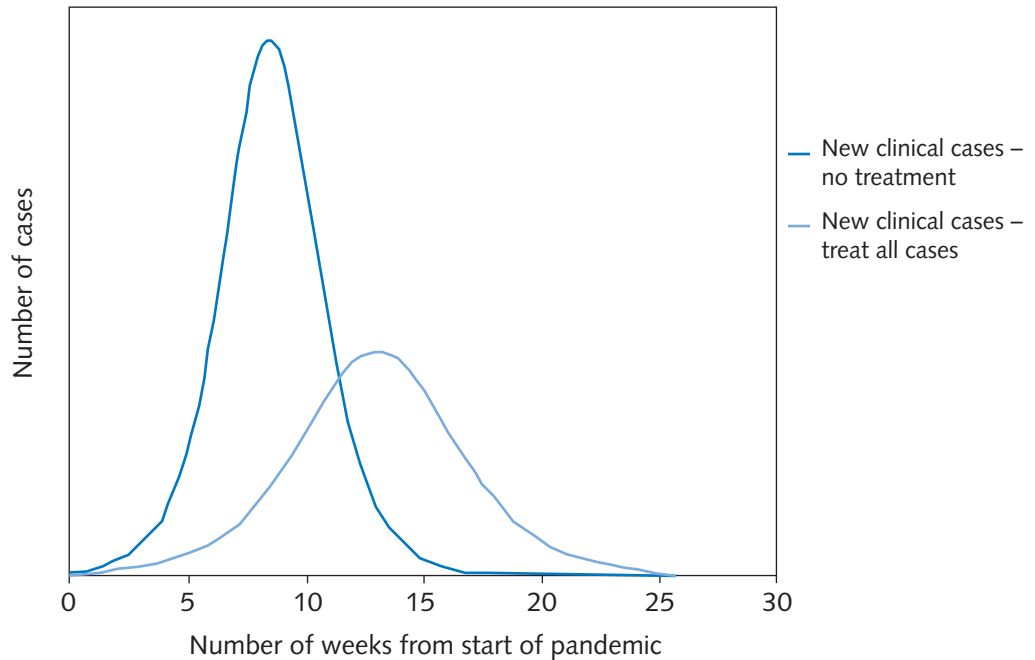
attack rates would require prioritisation of use, but operational plans should initially aim to make antiviral medicines available to all patients who have been symptomatic for less than 48 hours, preferably within 12 and no more than 24 hours from reporting symptoms indicative of influenza.

Adult treatment courses are stored as pre-packed capsules, but children weighing 23kg and under (about seven years old) require a weight-related dose of oseltamivir. Some of the stock is therefore in powder form for reconstitution into a suspension. Unless the child is obviously overweight or underweight, the dose is determined by age as a proxy:

Age	Indication	Dosage
Under 1 year	Oseltamivir is not licensed for use in this age group	Any decision to use requires expert clinical judgement, with dose according to weight
1–2 years	Body weight up to and including 15kg	30mg every 12 hours for five days
3–6 years	Body weight over 15kg and up to 23kg	45mg every 12 hours for five days
7+ years	Body weight 24kg and above	75mg every 12 hours for five days

Pre-identified licensed hospital pharmacy manufacturing units will be notified to manufacture the solution when the pandemic is declared, and other options for developing alternative formulations are being examined.

The prompt use of antiviral medicines will benefit individual patients and may also produce public health benefits by decreasing the overall clinical attack rate, shortening the period that individuals are able to shed virus and thus able to pass on the infection to others. Although there is considerable uncertainty over the level of reduction possible, one model suggests a relative lowering of the attack rate by up to one-third over the course of a pandemic (see Figure 3).

Figure 3: Indication of effects of antiviral treatment

The HPA will implement measures to monitor the susceptibility of the virus to antiviral medicines, assess their effectiveness in reducing complications and deaths and inform policy decisions. The Medicines and Healthcare products Regulatory Agency (MHRA) will identify the incidence and patterns of any adverse reactions.

It is also possible to use antiviral medicines as a preventive measure (prophylaxis) to protect against infection. Although some prophylactic use may help contain spread from initial cases and thus slow the development of the pandemic, protecting significant numbers of people for its entire duration would consume large numbers of treatment courses and still leave those treated susceptible to infection as soon as they stopped taking the medicine. Therefore, apart from attempts to contain initial spread, general prophylaxis is not currently regarded as an effective or practical response strategy. An alternative may be 'household prophylaxis', which provides post-exposure prophylaxis to immediate contacts at the same time as treating a symptomatic patient on the grounds that some of the contacts may already be incubating the infection. This could mitigate and delay the progress of a pandemic, particularly when combined with measures such as school closures. However, such a strategy would consume significantly greater stocks of antiviral medicines and mean that some people would need multiple treatment courses initially to prevent and then possibly treat infection. The potential effects of countermeasure strategies on resistance to antiviral medicines also requires further investigation. The Department of Health and devolved administrations will continue to review the supply and optimal use of pharmaceutical countermeasures.

7.5 Infection control and personal hygiene

Once efficient person-to-person transmission is established, preventing an influenza pandemic developing is unlikely to be possible, as most people are likely to be exposed to the virus at some stage during their normal activities. In order to protect others and reduce the spread of infection, anyone ill with influenza-like symptoms should stay at home, minimise social/family contact and go out only if absolutely necessary until symptoms have resolved. Those who are not symptomatic should continue normal activities for as long and as far as that is possible. They can reduce – but not eliminate – the risk of catching or spreading influenza by avoiding unnecessary close contact with others and routinely adopting high standards of personal and respiratory hygiene.

Applying basic infection control measures and encouraging compliance with public health advice are likely to make an important contribution to the UK's overall response. Simple measures will help individuals to protect themselves and others. The necessary measures include:

- staying at home when ill
- covering the nose and mouth with a tissue when coughing or sneezing
- disposing of dirty tissues promptly and carefully – bagging and binning them
- washing hands frequently with soap and warm water to reduce the spread of the virus from the hands to the face, or to other people, particularly after blowing the nose or disposing of tissues
- cleaning frequently touched hard surfaces (eg kitchen worktops, door handles) regularly using normal cleaning products
- avoiding crowded gatherings where possible, especially in enclosed spaces
- if suffering with influenza symptoms, wearing a disposable face mask to protect others should it become absolutely essential to go out (eg to go to hospital)
- making sure that children follow this advice.

Adopting such measures can help mitigate the overall health and wider impact of a pandemic by lowering the clinical attack rate and slowing its development, thereby spreading peak demand on services and enabling them to respond more effectively.

7.6 The use of face masks and respirators

Surgical face masks or respirators (masks that incorporate a filter) provide a physical barrier against the influenza virus provided that they are of an appropriate type, are worn correctly, changed frequently, removed properly, disposed of safely and used in combination with good universal hygiene behaviour. Face masks can be used to help protect those who may, for example, be at occupational risk from close or frequent contact with symptomatic patients and by those who are symptomatic to avoid contaminating others if they have no choice but to leave their home, though significant communication, supply, logistic and training aspects will need to be addressed. Disposable masks or respirators should generally only be worn once, for no longer than the time recommended by the manufacturer, and then discarded in an appropriate receptacle.

Although the perception that wearing a face mask in public places may be beneficial is widely held, there is little actual evidence of proportionate benefit from widespread use. The Government will not therefore be stockpiling face masks for general use. If individuals who are not symptomatic choose to purchase and wear face masks in public places, they should be worn properly and disposed of safely to reduce infection spread. Wearing masks at all times is not practical; so decisions in occupational settings must take account of the degree of risk associated with particular occupations or activities and be based on joint risk assessments carried out by employers and staff representatives.

Although further clarification and guidance on the use of face masks may become available in due course, the planning presumptions should be that anyone who is ill with influenza-like symptoms will be advised to stay at home. The general wearing of face masks in public places by those who do not have influenza symptoms will not be recommended and the Government will not supply face masks for that purpose. Judgements on respiratory protection in specific occupational or other settings will need to be based on joint risk assessments. Guidance to employers is available via the Health and Safety Executive website at www.hse.gov.uk/biosafety/diseases/influenza.htm

7.7 Internal travel restrictions

Modelling suggests that internal travel restrictions would have little positive impact on the total number infected by influenza over the entire course of a pandemic. Even a 60% reduction in all travel, including commuting to work, would only result in a small flattening of the profile of the pandemic across the country – reducing the national peak incidence by 5–10% and lengthening its period by a week, but also exacerbating the economic impact, increasing social disruption and adding to business/service continuity problems. These conclusions are consistent

with the lack of important observable differences between the course of seasonal influenza outbreaks in London – where there is considerable mixing on commuter and underground trains – and their course in other parts of the UK.

On balance, the planning presumption should be that the Government is unlikely to impose any restrictions on internal travel unless it becomes necessary to do so as the pandemic develops for public health reasons, in which case it is likely to be on an advisory basis.

The public may be advised to minimise non-essential (leisure/social) travel as a personal precautionary measure but to continue using public transport for essential journeys, adopting good personal hygiene measures and staggering journeys where possible.

7.8 Restrictions on public gatherings

Large public gatherings or crowded events where people may be in close proximity are an important indicator of ‘normality’ and can help maintain public morale during a pandemic. Whilst close contact with others – especially in a crowded confined space – accelerates the spread of an influenza virus, there is little direct evidence of the benefits or effects of cancelling such gatherings or events. Individuals may benefit from reduced exposure by not attending such events, but there would be very little benefit to the overall community. Reduction in travel to such events may also reduce spread, although the benefits of even major reductions in all travel are small.

Although evidence does not support a blanket ban on such events, individuals may decide not to attend them, parents might well choose to avoid the potential infection risk to children and organisers might decide to cancel to avoid any economic risks. If schools and early years childcare facilities are advised to close to children (see section 7.9), 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.

Transport difficulties, public order, crowd safety or other similar considerations may also affect decisions on staging such events. Organisers and/or governing bodies and licensing authorities (where relevant) might therefore decide to cancel events to minimise difficulties or avoid economic or other risks. Decisions can only be taken in the light of information and the circumstances at the time.

For planning purposes, the presumption should be that the Government is unlikely to recommend a blanket ban on public gatherings. However, informed judgements by the event organiser and/or governing body in conjunction with the regulatory authority may become necessary at the time. If international

events are due to be held in the UK with participants from affected areas, the Government may recommend postponement.

7.9 School closures

Influenza transmits readily wherever people are in close contact and is likely to spread particularly rapidly in schools. As children will have no residual immunity, they could be amongst the groups worst affected and can be 'super spreaders'. In the 1957 pandemic, up to 50% of schoolchildren developed influenza and, in some residential schools, attack rates reached up to 90%, often affecting the whole school within a fortnight.

Closing schools to pupils as an adjunct to the antiviral treatment planned for a pandemic might reduce its peak impact by an additional 10%, and the total number of clinical cases could also reduce by 10%, compared with antiviral treatment alone. Most of this reduction would be in school-age children, where the reduction in the number of clinical cases might be as high as 50%.

Advising all schools in an affected area to close may offer the most practical option. Whilst this would disrupt education and have a significant negative effect on services and businesses, particularly those highly dependent on working parents, these disadvantages would be outweighed by the children's lives saved. The same would apply to group early years/childcare settings where groups of children and parents often mix. Although there is less evidence relating to this sector than to schools, the same principles would apply. If schools were advised to close, it would be logical to extend that advice to all group early years/childcare settings, although this would increase the impact of closures upon services and businesses where working parents are employed. Reducing mixing between children outside school or other group early years/childcare settings may also be necessary for maximum benefit, but the impact would depend on the nature of that mixing. The Government would issue guidance on this as the pandemic develops.

The Department for Education and Skills (whose work has since been split between the Department for Children, Schools and Families and the Department for Innovation, Universities and Skills – see sections 4.4.8 and 4.4.9) issued guidance to local authorities, schools and providers of childcare services advising them to plan both for continuing to operate and for possible closures of schools and group early years/childcare settings during a pandemic. Similar advice has been issued by the devolved administrations.

The Government would take decisions on whether or not to advise closures on the basis of an assessment of the emerging characteristics and impact as the

pandemic develops. The trigger for advice to close would be confirmation of initial cases in the area.

On balance, plans should be prepared on the basis that:

- some school and group early years/childcare closures are likely
- decisions on whether to advise schools and group early years/childcare settings to close can only be made in the light of emerging information as a pandemic develops
- schools and early years/childcare settings will be advised to close only if it is anticipated that this will produce significant health benefits
- if the Government advises schools and group early years/childcare settings to close to pupils, the initial advice is likely to be to close for a few – probably two to three – weeks, after which the position would be reviewed, but the closure may be extended beyond this period
- any advice to close schools and group early years/childcare settings would be communicated to them through the local authority, which would be told through local resilience arrangements
- even if there is no general advice to schools and early years/childcare settings in an area to close, some may decide to do so because of staff shortages or local health and safety reasons.

Further guidance to local authorities, schools and group early years/childcare settings is available at www.teachernet.gov.uk/humanflupandemic

7.10 Pandemic-specific vaccination

Vaccination is widely used in the UK to offer protection against the seasonal influenza strains most likely to be circulating in that particular year. As a pandemic will result from the emergence of a new or modified strain, these routine vaccines are unlikely to offer protection and it will not be possible to develop a matching vaccine until the emerging influenza strain has been identified.

The Government has finalised advance supply contracts with manufacturers to make sufficient supplies of a matching vaccine available as soon as it is developed and is also working actively with the international community and pharmaceutical industry to speed development, testing and licensing. However, it may take four to six months before a matching vaccine is available and evaluated for safety, and considerably longer before it can be manufactured in sufficient quantities for the entire population given that international demand will be high. Realistically, it is therefore unlikely that a matching vaccine will

contribute much to dealing with the initial wave of a pandemic, unless its evolution, or the effectiveness of early control measures, result in a significantly slower developing pandemic than anticipated. However, it could be an important tool in preventing further cases, particularly if a second wave occurs.

For planning purposes, the presumption should be that a population-wide vaccination campaign is unlikely to be possible before or during the first pandemic wave, but may contribute to reducing the impact of subsequent waves if they occur.