

UK Influenza Pandemic Preparedness Strategy 2011

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1. Introduction

- 1.1 Each year, seasonal influenza affects many thousands of people in the UK. Occurring mainly in winter, it is an infectious respiratory disease capable of producing symptoms ranging from those similar to a common cold, through to very severe or even fatal. It brings about variable effects in successive winters and in some years causes intense pressure on health and social care services and significant levels of absence from the workplace and schools.
- 1.2 From time to time, with unpredictable frequency, a distinctly different strain of influenza virus will emerge that spreads rapidly across the world, causing an influenza pandemic. The World Health Organization (WHO) currently defines a pandemic as:
- “ ... the worldwide spread of a new disease. An influenza pandemic occurs when a new influenza virus emerges and spreads around the world, and most people do not have immunity.”¹
- 1.3 When an influenza pandemic occurs, large swathes of the population may become infected by the new virus over a relatively short period of time. It may be associated with mild to moderate illness in the population (which may or may not be widespread), or significant severe illness and mortality in certain age or patient groups, and may significantly disrupt the normal functioning of society. It is necessary to mobilise the collective efforts of society in order to manage the impact of a pandemic. For these reasons, a new influenza pandemic continues to be recognised as one of the greatest threats facing the UK.
- 1.4 In many respects, pandemic influenza can be responded to in the same way as seasonal influenza. The same good hygiene measures can reduce the spread of infection. The same self-care measures – staying at home, keeping warm, drinking plenty of fluids and the use of over the counter cold and ‘flu medicines - should be sufficient to meet the needs of most patients infected with an influenza virus that causes mild to moderate symptoms.
- 1.5 However, additional plans, over and above those for seasonal influenza, are needed for pandemic influenza to:
- Ensure that we are able to detect the emergence of a new virus and its arrival in the UK as quickly as possible and to determine the severity of illness, age groups and populations most affected and how transmissible it is.

¹ WHO website: “Pandemic (H1N1) 2009: frequently asked questions: what is a pandemic?”
http://www.who.int/csr/disease/swineflu/frequently_asked_questions/pandemic/en/index.html

- Take account of the potentially much greater number of people who will become ill with influenza and / or experience more severe symptoms and of the resulting potential impact on both the health system and the wider economy.
- Prepare for an influenza pandemic that may have a high impact on the health system and wider society.

1.6 Whilst influenza pandemics have been relatively infrequent over the past century, a new pandemic could emerge at any time. Plans for responding to any influenza pandemic build on and enhance normal business continuity planning for more routine pressures such as bad weather and winter illness. Pandemic preparedness is therefore an integral part of wider emergency response and preparedness.

Purpose of this document

1.7 The UK has been preparing for an influenza pandemic for some years. These preparations were tested by the H1N1 (2009) influenza pandemic although, in comparison with previous influenza pandemics, the H1N1 (2009) influenza pandemic was very mild. The response to the H1N1 (2009) influenza pandemic was the subject of an independent review chaired by Dame Deirdre Hine².

1.8 This document describes proposals for an updated, UK-wide strategic approach to planning for and responding to the demands of an influenza pandemic. It builds on, but supersedes, the approach set out in the *2007 National framework for responding to an influenza pandemic* (and the Scottish equivalent), taking account of the experience and lessons learned in the H1N1 (2009) influenza pandemic and the latest scientific evidence. An overview of the science underpinning the proposals is being published in parallel with this document.

1.9 This strategy is intended to inform the development of updated operational plans by local organisations and emergency planners.

Changes to the previous approach

1.10 Whilst the overall approach is not substantially different from the 2007 National Framework, there are a number of key changes, reflecting the lessons learned following the H1N1 (2009) influenza pandemic and the recommendations of the independent review and other reports. Chief among these are the need to:

- Develop better plans for the initial response to a new influenza pandemic, when the focus should be on rapid and accurate assessment of the nature of the influenza virus and its effects, both clinically and in relation to wider public health implications.

² Hine, Dame Deirdre. The 2009 Influenza pandemic: An independent review of the UK response to the 2009 influenza pandemic. Cabinet Office 2010

- Put in place plans to ensure a response that is proportionate to meet the differing demands of pandemic influenza viruses of milder and more severe impact, rather than just focusing on the “worst case” planning assumptions.
- Take greater account of age-specific and other differences in the rate and pattern of spread of the disease across the UK and internationally.
- Further explore statistical population-based surveillance, such as serology, to measure the severity of a pandemic in its early stages.
- Take better account of the learning from behavioural scientists about how people are likely to think, feel and behave during an influenza pandemic.
- Develop better plans for managing the end of an influenza pandemic – the recovery phase and preparation for subsequent seasonal influenza outbreaks.

1.11 This strategy has been developed jointly across the four UK Governments, with professional, NHS, social care and public health organisations, and based on advice from clinical, scientific and other experts. As a result of their experience in the H1N1 (2009) influenza pandemic, many organisations and individuals gained extensive experience of the challenges that can be posed by a pandemic and this has been reflected throughout this document.

2. The challenge of pandemic influenza

- 2.1 There are three types of influenza virus – A, B and C. Influenza A viruses cause most winter epidemics and can affect a wide range of animal species as well as humans. During any year, a small proportion of slightly altered viruses will emerge from the larger population of influenza viruses. The human immune system effectively protects against previously seen influenza viral strains. However, upon encountering such an altered virus pre-existing immunity will be only partial or even non-existent, leading to clinical symptoms in those infected.
- 2.2 Pandemic influenza occurs when an influenza A virus subtype emerges or re-emerges which is markedly different from recently circulating strains. Therefore, it is able to spread widely because few, if any, (and then mainly older) people have natural or acquired immunity to it. It is readily transmissible from person to person and capable of causing illness in a large proportion of those infected.
- 2.3 During the last century there were three influenza pandemics (Box 1). The most significant of these, the so-called Spanish Flu of 1918/1919, was estimated to responsible for between 20-50 million deaths more than would usually be expected. The other two declared pandemics of the last century, the Asian Flu of 1957/58 and the Hong Kong Flu of 1968/69, although associated with less morbidity and fewer deaths than the 1918 pandemic, nevertheless caused significant illness in the working population, affecting the UK's capacity to care for the sick and to maintain services essential to the national infrastructure. The true extent of the H1N1 (2009) pandemic and its impact on the population is still being assessed.

Box 1: Influenza pandemics of the last 100 years

Pandemic	Area of emergence	Estimated Case fatality ratio	Estimated attributable excess mortality worldwide	Age groups most affected (simulated attack rates)	GDP loss (% change)
1918-1919 "Spanish Flu"	Unclear	2-3%	20 – 50 million	Young adults	-16.9 to 2.4
1957 – 1958 "Asian Flu"	Southern China	0.1 -0.2%	1 – 4 million	Children	-3.5 to 0.4
1968 – 1969 "Hong Kong Flu"	Southern China	0.2-0.4%	1 – 4 million	All age groups	-0.4 to (-1.5)
2009 – 2010 "Swine Flu"	Mexico ²	<0.025% ¹	WHO estimates awaited. Likely to be significantly less than one million	Children (5-14), young adults and pregnant women	-0.03 to -0.05 ³

Information relating to 1918, 1957 and 1968 provided by WHO

¹ Based on analysis undertaken by the Health Protection Agency (HPA) – submitted for publication

² But emerging evidence of multiple locations

³ Based on WHO study of Thailand, Uganda and South Africa

2.4 Further details about the nature of influenza viruses and the experience of past pandemics are set out in the *Scientific Summary of Pandemic Influenza and its Mitigation* (www.dh.gov.uk/en/Publichealth/flu).

The uncertainty of pandemic influenza

2.5 Despite over sixty years of scientific scrutiny there is still controversy and debate over many issues related to influenza, including:

- The changes in animal viruses that are associated with human transmission and that might allow early warning.
- The genetic changes that indicate whether a new influenza virus is going to be associated with severe disease (pathogenicity) or the ease of transmission or periods of infectivity.
- The factors or circumstances that can cause severe illness and death in apparently healthy individuals infected with the virus, or why different influenzas attack different age groups.

2.6 Major challenges therefore have to be addressed when developing response plans to pandemic influenza.

Uncertainty about when an influenza pandemic could occur

- 2.7 The interval between influenza pandemics is variable, ranging from 11 to 39 years during the last century. There are no known markers that herald the start of a new pandemic. H5N1 emerged as a potential threat in 1997 and again in 2003; eight years on, the threat from the virus remains unchanged, although the emergence of a subtype capable of being efficiently transmitted to humans has not yet occurred, despite the global spread of the virus. In contrast, the common ancestor of H1N1 (2009) is estimated to have appeared between 3 November 2008 to 2 March 2009 and caused the first pandemic of the 21st century later in 2009³.
- 2.8 The WHO Global Influenza Surveillance Network, comprising 105 countries, acts as a global alert mechanism, monitoring circulating influenza viruses in order to detect the emergence of those with pandemic potential. Its work enables WHO to recommend the viral subtypes included in each year's seasonal influenza vaccine.

Unpredictability about how severe a future influenza pandemic could be

- 2.9 There are currently no genetic markers that will predict the pathogenicity or spread in the human population. Until the virus emerges and has affected a significant number of people, it is not possible to determine many of the features of the disease that will be important in assessing its severity or impact.
- 2.10 There is also no known evidence of association between the rate of transmissibility and severity of infection. It is possible that a virus could be both highly transmissible and cause severe symptoms.

The speed with which the pandemic can develop

- 2.11 Modern mass global transit also affords opportunities for the virus to be rapidly spread across the world, even before it has been identified. The short incubation period of influenza means that within a relatively short period of time a significant number of cases will appear across the globe. It is likely to take at least four to six months after a novel virus has been identified and isolated for an effective pandemic influenza vaccine to become available from manufacturers.
- 2.12 This means that it almost certainly will not be possible to contain or eradicate a new virus in its country of origin or on arrival in the UK. The expectation must be that the virus will inevitably spread and that any local measures taken to disrupt or reduce the spread are likely to have very limited or partial success at a national level and cannot be relied on as a way to 'buy time'.

³ Fraser C et al. Pandemic Potential of a Strain of Influenza A(H1N1): Early Findings. Science Vol. 324 no. 5934 pp. 1557-1561 DOI: 10.1126/science.1176062

The potential impact of an influenza pandemic

2.13 The impact a pandemic has on the population and wider society will be determined by three interdependent factors:

Disease characteristics: the number of cases and deaths, the proportion of severe disease in the population, the clinical groups most affected and the rate of onward transmission. This will only become possible to assess once sufficient data are available.

Service capacity: the number of patients presenting at primary care services and / or admitted to hospital and intensive care and specialist treatment (e.g. extracorporeal membrane oxygenation (ECMO)), and the capacity of public services, utilities and businesses to cope with increased demands and staff absence.

Behavioural response: the levels of concern experienced by the population, positive reactions to good respiratory and hand hygiene campaigns, the likely uptake of antiviral medicines and vaccination and the way health services are accessed and used.

2.14 So, for example:

- A highly transmissible virus producing relatively mild symptoms may still cause significant disruption to businesses and individuals as well as to health and social care services, due to the high incidence of sickness and staff absence over an extended period.
- A concentrated wave of infection, where a large number of people are infected over a short period with a more severe illness is likely to have a greater impact on society and service capacity than the same number of cases spread over a longer period.
- Uncertainty about the severity of a new pandemic, and any alarmist reporting in the media, may drive large numbers of people to seek reassurance from health providers, placing strain upon primary and secondary care services.

Potential economic impact of an influenza pandemic

2.15 Given the lack of relevant information, assessments of impact on the UK economy are necessarily simplistic and can only be illustrative. One such illustration would be to assume illness-related absence from work of 50 per cent of employees over the course of the pandemic and an average absence duration of about 3.5 per cent of a working year (roughly 1.5 weeks per person absent from work). Given UK GDP of about £1.6trillion (as estimated by HM Treasury (HMT) for 2012), this would mean a loss of perhaps £28billion. If only 25 per cent of workers were absent, rather than the 50 per cent assumed above, then this loss would be halved. This loss could be mitigated through effective business continuity planning.

Lessons from the H1N1 (2009) influenza pandemic

- 2.16 Pandemic planning in the first decade of the 21st century was largely driven by concerns about the potential of a pandemic associated with significant morbidity and mortality arising from the H5N1 (avian flu) virus. The emergence of the H1N1 (2009) influenza pandemic demonstrated the unpredictability of influenza pandemics. Most people experienced relatively mild illness. The recorded level of illness from influenza in the community in 2009 was below that experienced in the 1999/2000 influenza season – the most recent severe influenza season - and day-to-day life for most people continued largely unaffected.
- 2.17 Nonetheless, some younger adults and children, particularly those with underlying health conditions, and some women who were pregnant, experienced severe or even fatal illness and NHS primary and critical care services came under pressure. Furthermore, the virus re-emerged in the 2010/11 winter season again causing widespread illness.
- 2.18 There are no grounds for complacency and any presumption that the relatively mild H1N1 (2009) influenza pandemic is representative of future pandemics is dangerous. Nonetheless, this pandemic provided an important test of pandemic preparedness plans and important lessons have been identified:
- Uncertainty: there will be little or no information at the outset of a new pandemic about the severity of the illness, requiring accurate and detailed surveillance data, including numbers affected, hospital and critical care admissions, to be gathered as an early priority.
 - Speed: in local areas, the number of cases and demand for services can be expected to develop with great pace, requiring an agile yet coordinated response.
 - Local hotspots: the demands of the pandemic are unlikely to be uniform, but different areas will be under pressure at different times (and some not at all), requiring flexibility of approach, as well as planning for easy access to antiviral medicines.
 - Profile: the media and public and professional appetite for information is likely to be intense at times, requiring frequent, consistent and coordinated communications.
 - Duration: a pandemic wave can be expected to continue for many weeks, requiring robust arrangements to support individuals involved in the response. In time, further waves may also occur.
 - Cross-sector: whilst the health sector will be under particular pressure, the response will span different sectors and organisations, requiring close working and mutual support.
 - Wider applicability: the response to the H1N1 (2009) influenza pandemic built on, and enhanced, the response to more routine pressures such as those arising from severe weather.

Planning assumptions for a future influenza pandemic

- 2.19 Influenza pandemic planning in the UK has been based on an assessment of the “reasonable worst case”. This is derived from the experience and a mathematical analysis of influenza pandemics and seasonal influenza in the 20th century. This suggests that, given known patterns of spread of infection, up to 50 per cent of the population could experience symptoms of pandemic influenza during one or more pandemic waves lasting 15 weeks, although the nature and severity of the symptoms would vary from person to person.
- 2.20 For deaths, the analysis of previous influenza pandemics suggests that we should plan for a situation in which up to 2.5% of those with symptoms would die as a result of influenza, assuming no effective treatment was available.
- 2.21 However, it is important to note that:
- These “reasonable worst case” planning assumptions take no account of the potential effect of response measures such as practising good respiratory and hand hygiene, the use of antiviral medicines and antibiotics, and modern hospital care for those with severe illness. Such measures should reduce the number of patients needing hospital care or dying, even in a widespread and severe pandemic, although the extent cannot be known in advance.
 - Planning assumptions are not a prediction of what could happen. A lesson learned from the H1N1 (2009) influenza pandemic was that calling the planning assumptions ‘reasonable’ was not well understood. Many people wrongly thought that it meant this was the likely scenario as no indication was given of how unlikely it was that this scenario would be exceeded.
 - Planning assumptions can be informed by evidence from the past and analytical work but there will inevitably be an element of judgement. There is no ‘right answer’ and even experts may disagree on the ‘reasonable’ levels for planning.
 - Influenza pandemics are intrinsically unpredictable. Plans for responding to a future pandemic should therefore be flexible and adaptable for a wide range of scenarios, not just the “reasonable worst case”. During a pandemic, the assumptions on which to base the response will be updated in the light of emerging evidence about the range of likely scenarios at the time.
 - Even influenza pandemics with only mild or moderate impact are likely to put considerable pressure on services and the experience in local hotspot areas could be much more severe.
 - In an influenza pandemic that has a higher impact on society, services and businesses would be under extreme pressure and may be unable to continue to

meet all demands, even with the best of preparations. Step changes, including national contingency measures, could be necessary in such circumstances.

- 2.22 Despite the uncertainty associated with any planning assumptions, it is important to have a consistent basis for planning for a future pandemic response, to be used by local planners and central government alike. This avoids confusion and facilitates integrated preparation.
- 2.23 A review of the Government's approach to planning for high impact, low probability risks is currently underway. This includes an initial review of the process by which the assessments for events such as a pandemic are undertaken, with a view to ensuring that the costs and effort of planning and preparing for the unpredictable are commensurate with the risk. This is due to report in 2011. The reasonable worst case scenario (RWC) on which the planning assumptions below are based is reviewed on an annual basis. Should the RWC be altered in light of changes to the scientific or wider evidence on which it is based, the planning assumptions below may be subsequently revised.

Summary of planning assumptions for pandemic preparedness⁴

A pandemic is most likely to be caused by a new subtype of the Influenza A virus but the plans could be adapted and deployed for scenarios such as an outbreak of another infectious disease, eg Severe Acute Respiratory Syndrome (SARS) in health care settings, with an altogether different pattern of infectivity.

An influenza pandemic could emerge at any time, anywhere in the world, including in the UK. It could emerge at any time of the year. Regardless of where or when it emerges, it is likely to reach the UK very quickly.

It will not be possible to stop the spread of, or to eradicate, the pandemic influenza virus, either in the country of origin or in the UK, as it will spread too rapidly and too widely.

From arrival in the UK, it will probably be a further one to two weeks until sporadic cases and small clusters of disease are occurring across the country.

Initially, pandemic influenza activity in the UK may last for three to five months, depending on the season. There may be subsequent substantial activity weeks or months apart, even after the WHO has declared the pandemic to be over.

Following an influenza pandemic, the new virus is likely to re-emerge as one of a number of seasonal influenza viruses and based on observations of previous pandemics, subsequent winters are likely to see a different level of seasonal flu activity compared to pre-pandemic winters.

⁴ The Scientific Pandemic Influenza Advisory Committee's Modelling Sub-Group Summary (Annex 1). Available at: http://www.dh.gov.uk/ab/SPI/DH_095904

Although it is not possible to predict in advance what proportion of the population will become infected with the new virus, previous studies suggest that roughly one half of all people may display symptoms of some kind (ranging from mild to severe).

The transmissibility of the pandemic virus and the proportion of people in which severe symptoms are produced will not be known in advance.

Infectivity and mode of spread

Influenza spreads by droplets of infected respiratory secretions which are produced when an infected person talks, coughs or sneezes. It may also be spread by hand-to-face contact after a person or surface contaminated with infectious droplets has been touched.

Spread of the disease may also be possible via fine particles and aerosols but the contribution to spread is, as yet, still unclear with the latest evidence suggesting this mode of transmission may be more important than previously thought.

The incubation period will be in the range of one to four days (typically two to three). Adults are infectious for up to five days from the onset of symptoms. Longer periods have been found, particularly in those who are immunosuppressed. Children may be infectious for up to seven days. Some people can be infected, develop immunity, and have minimal or no symptoms but may still be able to pass on the virus.

Regardless of the nature of the virus, it is likely that members of the population will exhibit a wide spectrum of illness, ranging from minor symptoms to pneumonia and death. Most people will return to normal activity within 7 - 10 days.

All ages are likely to be affected but those with certain underlying medical conditions, pregnant women, children and otherwise fit younger 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. The exact pattern will only become apparent as the pandemic progresses.

Responding to an influenza pandemic

The UK will continue to maintain stockpiles and distribution arrangements for antiviral medicines and antibiotics sufficient for a widespread and severe pandemic.

Health services should continue to prepare for up to 30% of symptomatic patients requiring assessment and treatment in usual pathways of primary care, assuming the majority of symptomatic cases do not require direct assistance from healthcare professionals.

Between 1% and 4% of symptomatic patients will require hospital care, depending on how severe the illness caused by the virus is. There is likely to be increased demand for intensive care services.

For deaths, the analysis remains that up to 2.5% of those with symptoms would die as a result of influenza if no treatment proved effective. These figures might be expected to be reduced by the impact of countermeasures but the effectiveness of such mitigation is not certain. The combination of particularly high attack rates and a severe disease is also relatively (but unquantifiably) improbable. Taking account of this, and the practicality of different levels of response, when planning for excess deaths, local planners should prepare to extend capacity on a precautionary but reasonably practicable basis, and aim to cope with a population mortality rate of up to 210,000 – 315,000 additional deaths, possibly over as little as a 15 week period and perhaps half of these over three weeks at the height of the outbreak. More extreme circumstances would require the local response to be combined with facilitation or other support at a national level. In a less widespread and lower impact influenza pandemic, the number of additional deaths would be lower.

Staff Absence

Up to 50 per cent of the workforce may require time off at some stage over the entire period of the pandemic. In a widespread and severe pandemic, affecting 35-50 per cent of the population, this could be even higher as some with caring responsibilities will need additional time off.

Staff absence should follow the pandemic profile. In a widespread and severe pandemic, affecting 50 per cent of the population, between 15 per cent and 20 per cent of staff may be absent on any given day. These levels would be expected to remain similar for one to three weeks and then decline.

Some small organisational units (5 to 15 staff) or small teams within larger organisational units where staff work in close proximity are likely to suffer higher percentages of staff absences. In a widespread and severe pandemic, affecting 50 per cent of the population, 30-35 per cent of staff in small organisations may be absent on any given day.

Additional staff absences are likely to result from other illnesses, taking time off to provide care for dependants, to look after children in the event of schools and nurseries closing, family bereavement, practical difficulties in getting to work and/or other psychosocial impacts.

Research and Development

2.24 Given the uncertainty about pandemic influenza, research and development into animal and human influenza and behavioural science continues to be necessary. Research and development could make particular contribution to pandemic preparedness and response through the development of a universal vaccine and a better understanding of how influenza is transmitted between people.

- The development of a universal influenza vaccine would provide long-term protection against a wide range of influenza viruses. However, there is unlikely to be any

development capable of widespread application in this area in the short term and further research is needed.

- Influenza viruses can be transmitted by respiratory droplets, direct and indirect contact and small airborne particles (i.e. aerosols). However, the evidence base is insufficiently clear to determine the relative contribution of each of these routes in the transmission of influenza. Important health policy and infection control issues therefore remain unresolved; for example, how effective surgical masks or respirators might be reducing transmission. International organisations, including the WHO, have therefore prioritised understanding the modes of influenza transmission as a critical need for pandemic planning.

2.25 Pandemic influenza research in the UK is currently coordinated across government departments and research councils and active coordination between these bodies will continue. The Government supports national and international programmes of work in this area, e.g. WHO and the Wellcome Trust, and encourages exchange of information at all levels.

2.26 Rapid research is particularly vital at the onset of a pandemic to improve the understanding of the health and wider impacts of a new virus and to inform the response to the pandemic. Work is underway to commission the development of research protocols, with the necessary regulatory and ethical approvals in advance of a future pandemic to ensure that research can begin as soon as possible after a novel virus with pandemic potential arrives in the UK.

3. The strategic approach to pandemic preparedness

Strategic objectives

3.1 Any new influenza pandemic can be expected to have a significant effect on individual members of the population, the NHS and society at large. The overall objectives of the UK's approach to planning and preparing for an influenza pandemic are therefore to:

i. Minimise the potential health impact of a future influenza pandemic by:

- Supporting international efforts to detect its emergence, and early assessment of the virus by sharing scientific information.
- Promoting individual responsibility and action to reduce the spread of infection through good hygiene practices and uptake of seasonal influenza vaccination in high-risk groups.
- Ensuring the health and social care systems are ready to provide treatment and support for the large numbers likely to suffer from influenza or its complications whilst maintaining other essential care.

ii. Minimise the potential impact of a pandemic on society and the economy by:

- Supporting the continuity of essential services, including the supply of medicines, and protecting critical national infrastructure as far as possible.
- Supporting the continuation of everyday activities as far as practicable.
- Upholding the rule of law and the democratic process.
- Preparing to cope with the possibility of significant numbers of additional deaths.
- Promoting a return to normality and the restoration of disrupted services at the earliest opportunity.

iii. Instil and maintain trust and confidence by:

- Ensuring that health and other professionals, the public and the media are engaged and well informed in advance of and throughout the pandemic period and that health and other professionals receive information and guidance in a timely way so they can respond to the public appropriately.

3.2 Given the uncertainty about the scale, severity and pattern of development of any future pandemic, three key principles should underpin all pandemic preparedness and response activity:

- **Precautionary:** the response to any new virus should take into account the risk that it could be severe in nature. Plans must therefore be in place for an influenza pandemic with the potential to cause severe symptoms in individuals and widespread disruption to society.
- **Proportionality:** the response to a pandemic should be no more and no less than that necessary in relation to the known risks. Plans therefore need to be in place not only for high impact pandemics, but also for milder scenarios, with the ability to adapt them as new evidence emerges.
- **Flexibility:** there should be a consistent, UK-wide approach to the response to a new pandemic but with local flexibility and agility in the timing of transition from one phase of response to another to take account of local patterns of spread of infection and the different healthcare systems in the four countries.

3.3 In addition, pandemic preparedness and response will continue to be:

- Evidence based.
- Based on best practice in the absence of evidence.
- Based on ethical principles.
- Based on established practice and systems, as far as is possible.
- Across the whole of society.
- Coordinated at local, national and international levels.

Precautionary: responding in relation to the risk

3.4 In the early stages of the influenza pandemic, it is unlikely to be possible to assess with any accuracy the severity and impact of the illness caused by the virus. There will be some information available from other countries but the uncertainty about the quality of information that is available and its applicability to the UK will mean that the initial response will need to reflect the levels of risk based on this limited evidence. Good quality data from early cases arising in the UK is essential in further informing and tailoring the response.

Proportionality: planning for uncertainty

3.5 As reliable information becomes available, the appropriate response to the pandemic can be determined. Table 1 below outlines how the response might be taken forward in different pandemic scenarios. These are indicative only – the actual response measures will be determined at the time in the light of scientific, clinical and operational advice.

Table 1: Proportionate response to pandemic influenza

Impact	Nature and scale of illness	Key healthcare delivery	Impact on wider society	Public messages
<p>Initial phase</p> <p>(pandemic impact unknown at this stage)</p>	<p>Sporadic influenza cases may be reported from the community</p> <p>Possible limited local outbreaks (schools, care homes)</p> <p>Possible increased proportion of critical care cases with influenza</p>	<p>Response led by public health services supported by primary care and pharmacy services, and making preparations for extra support should this initial phase be extended</p> <p>Detection, diagnosis and reporting of early cases through testing and contact tracing</p> <p>National Pandemic Flu Service (NPFS) not activated. Local areas may start initial preparations to use NPFS and Antiviral Collection Points (ACPs)</p> <p>Influenza information line may be activated</p> <p>Consider support arrangements for Health Protection Teams</p> <p>Normal health services continue</p>	<p>Possible public concern arising from media reporting of cases at home or abroad</p> <p>Possible disruption to international travel and concern among intending / returning travellers</p> <p>Possible school closures to disrupt the spread of local disease outbreak, based on public health risk assessment</p> <p>Review and update of pandemic response plans</p>	<p>Advice on good respiratory and hand hygiene</p> <p>Advice about how to obtain further information e.g. to consult Government and NHS websites and other channels for up to date information</p> <p>Establish transparent approach to communicating emerging science, the level of uncertainty about severity and impact, and the likely evolution of the situation</p>

Table 1: Proportionate response to pandemic influenza

Impact	Nature and scale of illness	Key healthcare delivery	Impact on wider society	Public messages
<p>LOW</p>	<p>Similar numbers of cases to moderate or severe seasonal influenza outbreaks</p> <p>AND</p> <p>In the vast majority of cases - mild to moderate clinical features</p>	<p>Primary and hospital services coping with increased pressures associated with respiratory illness, with maximum effort</p> <p>Paediatric/Intensive care units (PICU / ICU) nearing or at maximum pressure</p> <p>No significant deferral of usual activities</p> <p>Influenza information line function active</p> <p>ACPs established in hotspots only – consider using community pharmacies alongside other arrangements</p> <p>NPFS active depending on pressures in primary care</p> <p>Scottish Flu Response centre at NHS 24 may be active in Scotland</p> <p>Use existing legislation to allow the supply of antiviral medicines at premises that are not a registered pharmacy</p>	<p>Increase in staff absence due to sickness – similar to levels seen in seasonal influenza outbreaks</p> <p>Consider arrangements for sickness absence surveillance</p> <p>No significant or sustained impact on service and business capacity</p>	<p>As above;</p> <p>Information on the pandemic and the clinical effects of infection, and what to do</p> <p>Information about antiviral medicines and tailored messages for children, pregnant women, elderly and other at risk groups (in liaison with expert bodies and support groups)</p> <p>How to use your local health service</p> <p>Employers planning in advance for sickness absence, service re-prioritisation and alternative ways of working</p>

Table 1: Proportionate response to pandemic influenza

Impact	Nature and scale of illness	Key healthcare delivery	Impact on wider society	Public messages
		Continued compliance with statistical reporting standards to maintain confidence in publicly disseminated information		

Table 1: Proportionate response to pandemic influenza

Impact	Nature and scale of illness	Key healthcare delivery	Impact on wider society	Public messages
MODERATE	<p>Higher number of cases than large seasonal epidemic</p> <p>Young healthy people and those in at-risk groups severely affected</p> <p>AND/OR</p> <p>more severe illness</p>	<p>Health services no longer able to continue all activity</p> <p>ICUs/PICUs under severe pressure</p> <p>Local and regional decisions to cease some health care activity</p> <p>Influenza information line function active</p> <p>NPFS activated as required in each country</p> <p>Local areas establish ACPs as required in each country</p> <p>Contingency plans for supporting care at home and respite care</p> <p>Continued compliance with statistical reporting standards</p>	<p>Supplies of electricity, gas and fuel will remain at near-normal levels of supply. Routine maintenance afforded a lower level of priority if there are staffing shortfalls, essential repairs expected to continue</p> <p>Potential disruption to general supplies if peak staff absence coincides with technical or weather related supply difficulties</p> <p>Prepare to implement business continuity arrangements for management of excess deaths, if necessary</p> <p>Concern among teachers and parents about infection spread in educational settings may lead to teacher and pupil absence</p> <p>Supply chain companies implement business continuity plans</p> <p>Possible review of legislation regarding drivers' hours</p> <p>Justice system affected by absence of staff, judiciary and</p>	<p>Information on the pandemic and the clinical effects of the infection</p> <p>Advice on seeking medical assessment when not improving or getting worse</p> <p>Information on NPFS</p> <p>Information on collection of medicines</p> <p>Information about antiviral medicines and tailored messages for children, pregnant women, elderly; and other at-risk groups (in liaison with expert bodies and support groups)</p> <p>Infection control and business continuity advice for specific occupations. E.g. funeral directors, registrars, cemetery and crematorium managers, police etc as appropriate</p> <p>Managing expectations of Critical Care</p>

Table 1: Proportionate response to pandemic influenza

Impact	Nature and scale of illness	Key healthcare delivery	Impact on wider society	Public messages
			other parties. Maintain essential services in accordance with established business priorities	
HIGH	<p>Widespread disease in the UK</p> <p>AND/OR</p> <p>most age-groups affected</p> <p>AND/OR</p> <p>severe, debilitating illness with or without severe or frequent complications</p>	<p>GPs, community pharmacies, district nurses, dental practitioners and social carers, independent sector, residential homes and voluntary organisations fully-stretched trying to support essential care in the community with consequential pressure on secondary care</p> <p>Hospitals can only provide emergency services</p> <p>NPFS working to capacity; ACPs under pressure</p> <p>Influenza information line function active</p> <p>Critical Care services: demand outstrips supply, even at maximum expansion</p> <p>Continued compliance with statistical reporting standards</p>	<p>Emphasis on maintaining supplies and staffing</p> <p>Transport, schools, shops affected by sickness and family care absences</p> <p>Numbers of deaths putting pressure on mortuary and undertaker services</p> <p>Possible implementation of national legislative changes to facilitate changes in working practice (e.g. death certification, drivers' hours, sickness self-certification requirements, Mental Health Act, benefits payments)</p> <p>Justice system affected by absence of staff, judiciary and other parties. Maintain essential services in accordance with established business priorities</p>	<p>Messages about progress of the pandemic, availability of healthcare and other services</p> <p>Advice on how to minimise risks of transmission</p> <p>Information on how to support family members and neighbours</p> <p>Advice on where to get help for emergencies</p> <p>Truth about how services are coping and what they are doing to cope</p> <p>Explanation of triage systems to align demand and capacity</p> <p>Some civil contingencies advice, including advice to specific occupations such as paramedics, funeral directors, registrars, cemetery and crematorium managers, police etc as appropriate</p>

Flexibility: managing the phases of pandemic response

- 3.6 The WHO is responsible for identifying and declaring an influenza pandemic based on the global situation.
- 3.7 Preparedness and planning by the WHO has been achieved over a number of years through the development of over-arching guidance, supporting material and tools. The most recent guidance, *Pandemic influenza preparedness and response: a WHO guidance document* was published in 2009. This guidance outlines the global phases that will be used to monitor the progress of a pandemic and suggests activities that might be undertaken at various points. These are useful at a global level to describe the spread of the pandemic and to inform global decisions, for example in relation to vaccine production. The WHO is revising this guidance.
- 3.8 However, the current WHO phases are not applicable as a planning tool within individual countries. As one of the first affected countries in 2009, the UK was well into its first wave of infection by the time WHO declared the start of the pandemic (WHO phase 6). The use of WHO phases as a trigger for the different stages of local response, as previously recommended, therefore proved to be confusing and unhelpful and a more flexible approach is needed in future.
- 3.9 Furthermore, the impact of the H1N1 (2009) influenza pandemic across the UK varied significantly, particularly in the early stages: London, the West Midlands and Glasgow experienced extreme pressures before parts of the North West and Northern Ireland had any cases. Even within areas, there were variations in number of cases and service impacts. It became apparent that the timing of the introduction or cessation of response measures needed to be determined flexibly in the light of local indicators. Practical delivery arrangements also need to be tailored to the organisational structures in each country of the United Kingdom.
- 3.10 Nonetheless, it is important in a public health emergency, such as a pandemic, to adopt a consistent overall approach to ensure an effective clinical and operational response, optimum use of limited resources and to maintain public confidence. The deployment of the web and telephony-based NPFS and legislative changes also have to be implemented on a country-wide (though not necessarily UK-wide) basis. Decisions about the nature of the national response to the pandemic – for example who should be given priority for vaccination and how antiviral medicines will be used – will therefore continue to be taken by Ministers based on expert scientific and clinical advice. Although there is local flexibility in how these policy decisions are implemented, if the impact of a decision in one local area or region is having a detrimental effect on other areas, then it may be appropriate to limit this local or regional flexibility.

Proposed new UK approach to the phases of pandemic response

- 3.11 In the light of this, a new UK approach to the indicators for action in a future pandemic response has been developed. This takes the form of a series of phases, named: **Detection, Assessment, Treatment, Escalation** and **Recovery** and incorporates indicators for moving from one phase to another.
- 3.12 The phases are not numbered as they are not linear, may not follow in strict order, and it is possible to move back and forth or jump phases. It should also be recognised that there may not be a clear delineation between phases, particularly when considering regional variation and comparisons.
- 3.13 **Detection** – This phase would commence on either the declaration of the current WHO phase 4 or earlier on the basis of reliable intelligence or if an influenza-related “Public Health Emergency of International Concern” (a “PHEIC”) is declared by the WHO. The focus in this stage would be:
- Intelligence gathering from countries already affected.
 - Enhanced surveillance within the UK.
 - The development of diagnostics specific to the new virus.
 - Information and communications to the public and professionals.

The indicator for moving to the next stage would be the identification of the novel influenza virus in patients in the UK.

Assessment – The focus in this stage would be:

- The collection and analysis of detailed clinical and epidemiological information on early cases, on which to base early estimates of impact and severity in the UK.
- Reducing the risk of transmission and infection with the virus within the local community by:
 - actively finding cases;
 - self isolation of cases and suspected cases; and
 - treatment of cases / suspected cases and use of antiviral prophylaxis for close / vulnerable contacts, based on a risk assessment of the possible impact of the disease.

The indicator for moving from this stage would be evidence of sustained community transmission of the virus, i.e. cases not linked to any known or previously identified cases.

These two stages – Detection and Assessment - together form the initial response. This may be relatively short and the phases may be combined depending on the speed with which the virus spreads, or the severity with which individuals and communities are affected. It will not be possible to halt the spread of a new pandemic influenza virus, and it would be a waste of public health resources and capacity to attempt to do so.

Treatment – The focus in this stage would be:

- Treatment of individual cases and population treatment via the NPFS, if necessary.
- Enhancement of the health response to deal with increasing numbers of cases.
- Consider enhancing public health measures to disrupt local transmission of the virus as appropriate, such as localised school closures based on public health risk assessment.
- Depending upon the development of the pandemic, to prepare for targeted vaccinations as the vaccine becomes available.

Arrangements will be activated to ensure that necessary detailed surveillance activity continues in relation to samples of community cases, hospitalised cases and deaths.

When demands for services start to exceed the available capacity, additional measures will need to be taken. This decision is likely to be made at a regional or local level as not all parts of the UK will be affected at the same time or to the same degree of intensity.

Escalation – The focus in this stage would be:

- Escalation of surge management arrangements in health and other sectors.
- Prioritisation and triage of service delivery with aim to maintain essential services.
- Resiliency measures, encompassing robust contingency plans.
- Consideration of de-escalation of response if the situation is judged to have improved sufficiently.

These two stages form the Treatment phase of the pandemic. Whilst escalation measures may not be needed in mild pandemics, it would be prudent to prepare for the implementation of the Escalation phase at an early stage of the Treatment phase, if not before.

Recovery – The focus in this stage would be:

- Normalisation of services, perhaps to a new definition of what constitutes normal service.
- Restoration of business as usual services, including an element of catching-up with activity that may have been scaled-down as part of the pandemic response e.g. re-schedule routine operations.
- Post-incident review of response, and sharing information on what went well, what could be improved, and lessons learnt.
- Taking steps to address staff exhaustion.
- Planning and preparation for a resurgence of influenza, including activities carried out in the Detection phase.
- Continuing to consider targeted vaccination, when available.
- Preparing for post-pandemic seasonal influenza.

The indicator for this phase would be when influenza activity is either significantly reduced compared to the peak or when the activity is considered to be within acceptable parameters. An overview of how services' capacities are able to meet demand will also inform this decision.

Evidence based

- 3.14 Preparations for, and response to, an influenza pandemic will continue to be informed by the best available scientific evidence at all levels. A set of scientific evidence papers covering the use of pharmaceutical and behavioural interventions have been commissioned to provide the evidence underpinning this strategy and are published alongside it. These have been reviewed by the Scientific Pandemic Influenza Advisory Committee and approved for publication alongside this strategy (see www.dh.gov.uk/en/Publichealth/Flu). The Government will continue to keep the emerging evidence under review.
- 3.15 In the early stages of a future influenza pandemic there will be uncertainty about the effects of the disease and ongoing development of the pandemic. Scientific and clinical advice alongside expert judgement will be important in directing the response. A Scientific Advisory Group for Emergencies (SAGE) will coordinate strategic scientific and technical advice to support UK cross-government decision making. This would include ensuring a common understanding of the scientific aspects of the pandemic, providing advice on prognosis, scientific evidence supporting decision making and highlighting the nature and extent of any uncertainties or differences in expert opinion.

- 3.16 England's Chief Medical Officer (CMO) acts as the UK Government's principal source of public health advice and information. Each of the devolved administrations (DAs) also has a CMO and, working collaboratively, they ensure a comprehensive and coordinated UK-wide public health approach. To ensure clinical and wider scientific advice is consistent, close collaboration between health protection organisations, SAGE and the CMOs is essential.

Ethical principles for pandemic preparedness

- 3.17 In preparing for, and responding to, an influenza pandemic, governments, organisations and individuals will face difficult decisions and choices that may impact on the freedom, health and in some cases prospects of survival of individuals. Decisions will be needed on how to make the fairest use of resources and capacity, in proportion to the demands of the pandemic alongside other pressures that may be in place at the same time, in order to minimise the harm caused by the pandemic as a whole. Many people are also likely to face individual dilemmas and tensions between their personal, professional and work obligations.
- 3.18 Given the potential level of additional demand, capacity limitations, staffing constraints and potential shortages of essential medical material, including medicines, hard choices and compromises may be particularly necessary in the fields of health and social care.
- 3.19 People are more likely to understand and accept the need for, and the consequences of, difficult decisions if these have been made in an open, transparent and inclusive way. National and local preparations for an influenza pandemic should therefore be based on widely held ethical values, and the choices that may become necessary should be discussed openly as plans are developed, so that they reflect what most people will accept as proportionate and fair. At the request of the Department of Health, an independent committee with cross-UK representation has developed an ethical framework to inform the development and implementation of response policy both in the health and social care sector and more widely. The systematic use of the principles it contains can act as a checklist to ensure that all the ethical aspects have been considered at all levels.
- 3.20 The ethical framework was first published in 2007. It has been reviewed by the Committee on Ethical Aspects of Pandemic Influenza (CEAPI) in the light of the experience of the H1N1 (2009) influenza pandemic and the Committee has concluded that it remains appropriate and fit for purpose in planning for a further pandemic. The framework is available online⁵. The routine use, in each organisation, of professional practice mechanisms based on the ethical framework will support staff in resolving any ethical issues that may arise out of their work.

⁵ http://www.dh.gov.uk/en/Publicationsandstatistics/Publications/PublicationsPolicyAndGuidance/DH_080751

Building on established systems and business continuity

3.21 Pandemic influenza response plans should be based on existing systems and processes wherever possible. Routine processes, including those for managing seasonal influenza outbreaks each year, and business continuity plans for responding to other pressures, such as winter illness or major incidents such as flooding, are well established, tried and tested. Building on these familiar procedures provides a robust foundation for responding to fluctuation in demand for capacity that may occur in an influenza pandemic.

Whole of society preparedness

3.22 The challenges of an influenza pandemic are far reaching and require a cross-society approach. As with all emergencies, Local Resilience Fora⁶ (LRFs) take primary responsibility for developing preparedness plans for an effective operational response to major emergencies and therefore local responders have existing coordinated plans and arrangements in place which would shape the response to a pandemic. Many organisations and sectors have reviewed and updated these during and since the H1N1 (2009) influenza pandemic. Current generic response arrangements at regional and local level are set out in detail in *Emergency Response and Recovery*⁷. As new organisations are formed planning will need to review and reflect the changes in structure and capacity available to deliver the response. Chapter 7 sets out the whole of society response.

3.23 Experience from previous emergency responses indicates a number of key factors which are critical for ensuring effective, coordinated responses. These are:

- **Clear leadership:** Pre-established and tested command and control structures with clear roles and responsibilities, along with strong working relationships, are essential in ensuring coordination and channelling communication at every level of the response. However, those placed in leadership roles also need to understand the importance of public confidence and engagement, facilitated through an approach encompassing openness and transparency.
- **Exercising arrangements:** To test that response plans work and are efficient. Staff familiarity with plans and their likely roles and responsibilities helps to ensure that arrangements run smoothly. The involvement of relevant partner organisations in testing and exercising will improve understanding of each other's response plans and ensure that any links and assumptions are identified and validated. This is particularly important during a period of widespread organisational and structural change.

⁶ LRFs operate in England and Wales. The Scottish equivalent is Strategic Coordinating Groups.

⁷ <http://www.cabinetoffice.gov.uk/resource-library/emergency-response-and-recovery>

- **Knowledge & Information Management:** Effective knowledge and information management is important during any adverse event. A structured approach to knowledge management throughout the planning and response phases will help with evaluation and recovery following a pandemic and can assist in incorporating lessons learned which will improve and strengthen any future response.

Local and national coordination

- 3.24 Given the national scale, complexity and international dimensions of a pandemic, strong cross-Government planning and Central Government coordination remains critical. The Department of Health is the lead government department for pandemic preparedness and response. It has overall responsibility for developing and maintaining the contingency preparedness for the health and social care response, maintaining liaison with international health organisations and providing information and specialist advice to Ministers, other Government departments and responding organisations.
- 3.25 The DAs and England share a common strategic approach to pandemics and the four health departments work closely together during both planning and response. Strong clinical and senior official liaison across the four nations strengthens the UK-wide coordination and cooperation.
- 3.26 All Government departments are directly or indirectly involved in preparing for an influenza pandemic and play an active role in informing and supporting contingency planning in their areas of responsibility.
- 3.27 The National Security Council (Threats, Hazards, Resilience and Contingencies) (NSC (THRC)) Committee, comprising Ministers from across Central Government departments and the DAs, oversees and coordinates national preparations for all key UK risks including pandemic influenza.
- 3.28 During a pandemic NSC(THRC) will coordinate Central Government activities, make key strategic decisions such as the countermeasures required and determine UK priorities. It is also likely that Cabinet Office Briefing Room (COBR) will activate a Scientific Advisory Group for Emergencies (SAGE) to coordinate strategic scientific and technical advice to support UK cross-government decision making. The Department of Health, as lead Government department, would work closely with the DAs using meetings of the four nations' health departments at official and ministerial level, which worked particularly well during the H1N1 (2009) influenza pandemic, to agree health specific issues ahead of NSC(THRC) discussions. Further details on how the UK Government responds to emergencies can be found at <http://interim.cabinetoffice.gov.uk/media/132685/conops.pdf> .

International coordination and assistance

- 3.29 An influenza pandemic is an international public health emergency. UK public health services have a key role in contributing to global efforts to prevent and detect the emergence of a new virus, international surveillance and intelligence gathering, and developing public health policy and sharing best practice internationally. At the global level the WHO leads and coordinates international surveillance, investigation and the response.
- 3.30 Within the European Union (EU) there is collaboration between Member States in the prevention, monitoring and control of communicable disease. An Early Warning and Response System (EWRS) alerting mechanism is operated by the European Centre for Disease Prevention and Control (ECDC) which also provides EU-wide risk assessment and technical advice in risk management. The EU Health Security Committee facilitates the sharing of information and best practice amongst Member States. The UK will continue to play an active role in supporting European cooperation, including the rapid sharing of generated analyses that the UK would also expect in return.
- 3.31 The UK will also continue to support other collaborative approaches to pandemic preparedness and response. In particular, the Global Health Security Action Group (GHSAG), which consists of the G7 countries and Mexico, provides opportunity for the exchange of information and best practice.
- 3.32 The UK's approach to international assistance is led and coordinated across government by the Department for International Development (DfID). The Government response will generally be through multilateral organisations, such as the WHO, the wider UN family and the Red Cross. The UK has a special responsibility for its overseas territories. The Department of Health will consider the potential impact on the UK's Overseas Territories, and support them as appropriate.
- 3.33 There is likely to be a need for information sharing between the UK (e.g. DH, The Foreign and Commonwealth Office, the NHS, and public health organisations), governments abroad and their representations here. Relevant contact points and information for both people in the UK and UK Citizens abroad will be appropriately signposted at the outbreak of a potential pandemic.

4. Key elements of pandemic response

- 4.1 The 2007 National Framework set out a ‘**defence in depth**’ approach to responding to pandemic influenza. This was based on a combination of behavioural interventions and the availability of pharmaceutical countermeasures. The reviews of recent scientific evidence, published alongside this document, confirm the continuing overall appropriateness of this approach.
- 4.2 The UK will therefore continue to adopt a ‘defence in depth’ strategy to minimise the spread and to treat individual clinical cases of pandemic influenza. This approach will protect the public by:
- Detecting and assessing the impact of the virus and identifying (and quantifying) the groups most at risk of severe illness, hospitalisation, admission to ICU / PICU, and death.
 - Reducing the risk of transmission and infection with the virus as far as possible, supported by good hygiene advice, appropriate behavioural interventions, and provision of personal protective equipment for front-line health and social care staff.
 - Minimising serious illness and deaths, supported by rapid access to antiviral medicines, antibiotics and healthcare.
 - Protecting the public through preventing the disease when possible and appropriate, through vaccination.
 - Promoting work during the inter-pandemic period to develop the capacity and resilience of the UK.
- 4.3 During a pandemic, the Government will need to make final decisions and issue advice on the application of specific measures in the light of emerging scientific evidence and data. In doing so, the ethical framework and in particular the principles of precaution (which assists in ensuring that harm is minimised), proportionality and flexibility will apply throughout. No additional restrictions, such as restrictions to public events will be placed on the public unless it is absolutely necessary to protect the health of the public and then only for so long as it is appropriate.

Detection & Assessment

- 4.4 Early comprehensive assessment of the epidemiological and clinical characteristics of a novel influenza virus is essential to enable the implementation of a proportionate response to a new pandemic. As the pandemic evolves, it will be necessary to monitor

and report the spread and impact of the pandemic to high statistical standards. This is the role of surveillance and is a central responsibility of the public health services, working closely with health care providers. There will also be a need to assess rapidly the uptake and effectiveness of the clinical measures that are undertaken.

- 4.5 The primary aim of surveillance is to ensure that accurate, timely, and reliable information is available to understand the nature of the disease and to inform decision making about the response to the pandemic. Surveillance data also informs the ongoing operational response to an influenza pandemic, the public and professions.
- 4.6 The key objectives of surveillance are to:
- Identify key clinical, epidemiological and virological features of a new influenza virus.
 - Count severe cases and identify risk groups affected.
 - Describe the evolving pandemic, including how the virus spreads over time and regionally, and its impact at the population level (e.g. by age-group) particularly in relation to hospitalisations and mortality.
 - Measure the uptake and safety of various pharmaceutical countermeasures e.g. antiviral medicines and vaccines.
- 4.7 Pandemic influenza surveillance will be based on established seasonal influenza surveillance arrangements, although in some cases at increased frequency. These include data relating to:
- Primary care consultations and calls to NHS telephone and web-based advisory services relating to influenza-like illness.
 - Virological 'sentinel' surveillance schemes in primary care.
 - Laboratory analysis of a sample of cases to identify the genetic features of the virus and any changes to it such as development of antiviral resistance.
 - Increases in the number of deaths compared to the expected norms (e.g. by age group) for the time of year (excess all-cause mortality data).
 - Influenza vaccination uptake and effectiveness.
- 4.8 As with the outbreak of any infectious disease, some additional measures will be required at the start of an influenza pandemic:
- Data sharing with international organisations such as the WHO and the ECDC and individually with other countries.
 - Rapid assessment of the first cases and their close contacts to provide an early insight of the clinical and epidemiological features of cases.
 - Establishment of representative virological sampling schemes linked to new systems (e.g. antiviral medicine distribution systems)

- Detailed data gathering of information on cases of severe disease admitted to hospital.
- Clinical, epidemiological and virological investigation of early deaths caused by the pandemic virus.
- Rapid monitoring of age-specific excess mortality using data from the General Registry Office on-line system.
- Rapid assessment through community surveillance, e.g. telephone surveys to determine the rate of illness and healthcare seeking behaviour in the general population.
- Establishment of specific systems complying to robust statistical standards to monitor the effectiveness and safety of any pandemic vaccine programme.
- Cross-sectional population sero-prevalence surveys to estimate background population immunity and age-specific rates of infection.

4.9 The gathering of this data is the collective responsibility of the public health services of each of the four countries of the UK. Building on the lessons from the H1N1 (2009) influenza pandemic, work is underway to:

- Improve the comparability of pandemic surveillance data across the UK using robust statistical standards (whilst recognising the need to maintain longitudinal surveillance datasets within each country).
- Enhance sero-prevalence, community and hospital based surveillance.

Reducing the spread of disease: infection control & respiratory and hand hygiene

4.10 Influenza viruses can spread from person to person via the respiratory route when an infected person coughs and sneezes, and through hand-to-face (nose, mouth or eye) contact after a person or surface that is contaminated with infectious respiratory droplets has been touched. Spread of the disease is also possible via fine particles and aerosols but the contribution to spread is as yet still unclear. Research⁸ suggests that influenza viruses can survive on commonly touched surfaces for periods ranging from a few hours to several days, depending on environment condition, but certainly long enough to facilitate person-to-person transmission. In general, viruses survive longer on hard non-porous surfaces, such as door handles, than on soft porous surfaces, such as tissues.

4.11 To protect others and reduce the spread of infection, anyone ill with pandemic influenza should:

- Stay at home.

⁸ Routes of transmission of the influenza virus. Scientific Evidence Base Review 2011

- Minimise close contacts.
- Adopt thorough respiratory and hand hygiene practices, i.e. covering the nose and mouth with a tissue when coughing and sneezing, disposing immediately of that tissue after use, and washing hands frequently with soap and warm water, or alcohol gel if water is not readily available.

Facemasks and respirators

- 4.12 Facemasks and respirators have a role in providing healthcare worker protection, as long as they are used correctly and in conjunction with other infection control practices, such as appropriate hand hygiene⁹ and, most importantly, vaccination of frontline healthcare workers as soon as vaccine becomes available.
- 4.13 Facemasks, or surgical masks, are primarily designed to protect the environment from particles expelled by the wearer. If fitted properly, and used and changed in accordance with manufacturers instructions, they provide a physical barrier to large droplets but will not provide full respiratory protection against smaller particles such as aerosols.
- 4.14 Respirators are more sophisticated than facemasks and are designed to protect the wearer from breathing in fine or very small airborne particles (i.e. aerosols), which might contain viruses and other microorganisms, in addition to larger droplets. They should be worn when performing procedures that have the potential to generate infectious aerosols; examples include intubation, extubation and related procedures. It is a legal requirement that anyone who might be required to wear a respirator be fit-tested to ensure that an adequate seal can be achieved to provide the best level of protection and that training in use be provided. More than one make of respirator should be made available to help account for different face shapes among employees.
- 4.15 Although there is a perception that the wearing of facemasks by the public in the community and household setting may be beneficial, there is in fact very little evidence of widespread benefit from their use in this setting. Facemasks must be worn correctly, changed frequently, removed properly, disposed of safely and used in combination with good respiratory, hand, and home hygiene behaviour in order for them to achieve the intended benefit. Research also shows that compliance with these recommended behaviours when wearing facemasks for prolonged periods reduces over time.
- 4.16 The Government already has in place stockpiles of facemasks and respirators for health and social care workers. In line with the scientific evidence, the Government will not stockpile facemasks for general use in the community. The responsibility for providing advice on the use of facemasks and respirators, as well as their provision and training, for non-health workers in the public and private sector rests with employers.

⁹ The use of facemasks and respirators in an influenza pandemic. Scientific Evidence Base Review 2011

- 4.17 Employers will need to undertake risk assessments to determine whether the provision of facemasks or respirators is appropriate for their staff, and workers who need to wear a facemask or respirator will need to receive training in their safe use, removal and disposal. Where a risk assessment indicates respirators are necessary, staff must be fit-tested. Employers should refer to Pandemic Infection Control Guidance at www.dh.gov.uk/pandemicflu (and www.hps.scot.nhs.uk), and Health & Safety Executive (HSE) guidance on conducting risk assessments when considering the supply of facemasks and respirators to other front-line workers (www.hse.gov.uk/biosafety/diseases/pandemic.htm). These policies will be kept under review as new scientific evidence emerges.

International travel, border restrictions and screening

- 4.18 The Foreign and Commonwealth Office will issue advice regarding travel to affected countries. There are no plans to attempt to close borders in the event of an influenza pandemic. The UK generally has a high level of international connectivity, and so is likely to be one of the earlier countries to receive infectious individuals. Modelling suggests that imposing a 90% restriction on all air travel to the UK at the point a pandemic emerges would only delay the peak of a pandemic wave by one to two weeks^{10,11}. Even a 99.9% travel restriction might delay a pandemic wave by only two months. During 2009 it became clear that the pandemic virus had already spread widely before international authorities were alerted, suggesting that in any case the point of pandemic emergence had been missed by several weeks. The economic, political and social consequences of border closures would also be very substantial, including risks to the secure supply of food, pharmaceuticals and other supplies.
- 4.19 In general, normal port health arrangements will apply during a pandemic. Given the expected two to three day incubation period for pandemic influenza, there is no evidence of any public health benefit to be gained from meeting planes from affected countries or similar pro-active measures such as thermal scanning or other screening methods. Such measures are largely ineffective, impractical to implement and highly resource intensive^{12,13}.
- 4.20 Passengers should be encouraged to self-report symptoms to crew and ground staff to enable information gathering, investigations and treatment to be undertaken. This will be accompanied by an information campaign at ports of entry, including international train stations, reminding passengers of the symptoms of influenza, what to do should they

¹⁰ Cooper BS, Pitman RJ, Edmunds WJ, Gay NJ (2006) Delaying the International Spread of Pandemic Influenza. *PLoS Med* 3(6): e212. doi:10.1371/journal.pmed.0030212

¹¹ Ferguson NM, Cummings DAT, Fraser C, Cajka JC, Cooley PC, Burke DS. Strategies for mitigating an influenza pandemic. *Nature* 442, 448-452 (27 July 2006)

¹² Cowling BJ, Lau LLH, Wu P, Wong HWC, Fang VJ, Riley s, Nishiura H. "Entry screening to delay local transmission of 2009 pandemic influenza A (H1N1)" *BMC Infectious Diseases* 2010, 10:82

¹³ Priest PC, Duncan AR, Jennings LC, Baker MG, 2011 Thermal Image Scanning for Influenza Border Screening: Results of an Airport Screening Study. *PLoS ONE* 2011, 6(1)

become ill, and to defer travel if unwell. Communications to the general public to explain the basis for the policy, as well as to reassure them, will also be important.

Restrictions on public gatherings and public transport

- 4.21 There is very limited evidence that restrictions on mass gatherings will have any significant effect on influenza virus transmission¹⁴. Large public gatherings or crowded events where people may be in close proximity are an important indicator of ‘normality’ and may help maintain public morale during a pandemic. The social and economic consequences of advising cancellation or postponement of large gatherings are likely to be considerable for event organisers, contributors and participants. There is also a lack of scientific evidence on the impact of internal travel restrictions on transmission and attempts to impose such restrictions would have wide-reaching implications for business and welfare.
- 4.22 For these reasons, the working presumption will be that Government will not impose any such restrictions. The emphasis will instead be on encouraging all those who have symptoms to follow the advice to stay at home and avoid spreading their illness. However, local organisers may decide to cancel or postpone events in a pandemic fearing economic loss through poor attendances, and the public themselves may decide not to mix in crowds, or use public transport if other options are available.

School closures

- 4.23 There is modelling data highlighting the potential benefit of school closures in certain circumstances¹⁵, both in terms of protecting individual children from infection and in reducing overall transmission of the virus in the population. However, to be effective prolonged closures are required. This would involve schools over a wide area, but carries a risk that social mixing of children outside school would defeat the object of the closures.
- 4.24 However, under some circumstances head teachers (and their Boards of Governors where relevant) may take the decision to close individual establishments temporarily. Such closures should be guided by the following planning principles:
- Using a precautionary approach in the early stages of an influenza pandemic and depending on the public health risk assessment, Directors of Public Health may advise localised closures (individual schools or catchment areas). The purpose would be to reduce the initial spread of infection locally while gathering more information about the spread of the virus.

¹⁴ Impact of mass gatherings on an influenza pandemic. Scientific Evidence Base Review 2011

¹⁵ House T, Baguelin M, van Hoek AJ, White PJ, Sadique Z, Eames K, Read JM, Hens N, Melegaro A, Edmunds WJ, MJ Keeling. Modelling the impact of local reactive school closures on critical care provision during an influenza pandemic. *Proceedings of the Royal Society series B* (in press).

- Once the virus is more established in the country, the general policy would be that schools should not close – unless there are specific local business continuity reasons (staff shortages or particularly vulnerable children). This policy will be reviewed in light of information about how the pandemic is unfolding at the time.
- 4.25 The impact of closure of schools and similar settings on all sectors would have substantial economic and social consequences, and have a disproportionately large effect on health and social care because of the demographic profile of those employed in these sectors. Such a step would therefore only be taken in an influenza pandemic with a very high impact and so, although school closures cannot be ruled out, it should not be the primary focus of schools' planning.

Minimising serious illness and deaths

- 4.26 A pandemic will inevitably place substantial pressures on health services. Clinical countermeasures such as antiviral medicines and antibiotics may reduce the severity of illness in individuals, lessen the number of deaths resulting from pandemic influenza and ease pressure on intensive care services.

Antiviral medicines

- 4.27 When used to treat influenza, antiviral medicines, such as oseltamivir (Tamiflu™) and zanamivir (Relenza™), can reduce the length of symptoms and usually their severity¹⁶. Evidence suggests that when antivirals are taken within two days of the onset of symptoms, the total duration of illness is reduced by around a half to one full day. There may therefore be a reduction in the burden on primary and secondary healthcare services. Further evidence suggests that a range of public health benefits may be achieved such as a reduction in the number of complications, hospitalisations and deaths. Although licensed for use within 48 hours of symptom onset, clinical trials' data are very clear that the earlier that treatment can be started the greater the likely degree of benefit. Therefore, the individuals for whom antiviral medicines are recommended must be treated as soon as possible. In addition, in persons with severe illness, treatment commenced more than 48 hours of symptom onset may still be beneficial and reduce the risk of fatal outcome and should therefore be considered on a case-by-case basis.
- 4.28 During seasonal influenza outbreaks, the prescription of antiviral medicines is normally restricted to those in 'at risk' groups. The Department of Health is planning to change regulations to allow GPs to prescribe antiviral medicines for patients who are not in an at-risk group, but who they consider may be at risk of developing serious complications from influenza. It is proposed that GPs will be guided by the CMO in using this flexibility. However, in a pandemic, where infection levels are expected to be widespread due to the absence of population immunity and the nature and severity of

¹⁶ Use of antivirals in an influenza pandemic. Scientific Evidence Base Review 2011

the virus is unknown in advance, and when a vaccine may be unavailable for some time, more widespread deployment of antiviral medicines may be recommended.

- 4.29 The Government plans to maintain a stockpile of antiviral medicines for use in a new pandemic. In line with current scientific advice, both oseltamivir and zanamivir have been stockpiled to ensure the response can be as flexible and resilient as possible, particularly against the risk of a pandemic virus strain developing resistance to oseltamivir.
- 4.30 In the light of scientific and clinical advice at the time, antiviral treatment may be limited, for part or all of the pandemic, to those in at risk groups if the pandemic proves to be very mild in nature or if antiviral medicine supplies are being depleted too rapidly.

The use of antiviral medicines for prophylaxis

- 4.31 Antiviral medicines can also be used for the prophylaxis (or prevention) of pandemic influenza, as a way of limiting the spread of the disease from person to person. Targeted prophylaxis on clinical grounds (i.e. for those in at risk groups) can be an effective way of protecting at risk individuals in a household where there is illness, as was demonstrated during the H1N1 (2009) influenza pandemic.^{17,18} Antiviral medicines used in prophylaxis will only protect an individual for as long as the medicine is taken. After the end of prophylaxis, the individual remains susceptible to infection and no long-term immunity is conferred.
- 4.32 Modelling data suggest that a widespread policy of “household prophylaxis” - that is giving antiviral medicines to the household contacts of a person with influenza symptoms - could, in theory at least, substantially reduce the overall number of cases of infection in the population¹⁹. However, to achieve this effect, all household contacts of all patients with influenza symptoms would have to receive the antiviral medicines within 24 hours of the onset of their symptoms.
- 4.33 It is unlikely to be possible to assure these conditions have been met on a nationwide and universal basis, and such a strategy would further result in large numbers of antiviral medicines being wasted or issued unnecessarily (if, for example, the sick person in fact had another illness). In addition, there is evidence from the H1N1 (2009) influenza pandemic that many individuals who received them for prophylaxis did not complete the course. For these reasons, apart from a very limited initial period as part of a range of precautionary measures to attempt to reduce the risk of transmission and infection with the virus, the Government does not plan at the current time to adopt a general strategy of household prophylaxis.

¹⁷ van Boven M, Donker T, van der Lubben M, van Gageldonk-Lafeber RB, te Beest DE, et al. (2010) Transmission of Novel Influenza A (H1N1) in Households with Post-Exposure Antiviral Prophylaxis. PLoS ONE 5(7): e11442. doi:10.1371/journal.pone.0011442

¹⁸ Pebody R et al, EID in press

¹⁹ Ferguson NM, Cummings DAT, Fraser C, Cajka JC, Cooley PC, Burke DS. Strategies for mitigating an influenza pandemic. Nature 442, 448-452 (27 July 2006)

Antibiotics

- 4.34 Secondary bacterial infections are likely to be a major cause of death during an influenza pandemic²⁰. The main role of antibiotics is to reduce the severe illness and deaths which could arise from such secondary complications.
- 4.35 To ensure sufficient levels of antibiotics would be available in a pandemic, the Government will maintain a stockpile of antibiotics most likely to be useful for complications arising from pandemic influenza. These would be made available if there was clear evidence of shortages in the supply chain in primary or secondary care during a pandemic.

Protecting people through vaccination

- 4.36 People considered to be “at risk” from seasonal influenza are invited for vaccination each year. However, as an influenza pandemic will result unexpectedly from an entirely new viral strain or subtype, seasonal influenza vaccines could not be expected to provide any protection against pandemic influenza.
- 4.37 There are two distinct types of pandemic vaccine:
- **Pre-pandemic vaccines** that are produced in advance of a pandemic and are designed to protect against a strain of influenza virus that experts judge to be a potential cause of a future pandemic, e.g. H5N1. The degree of protection will depend on how similar the pandemic viral strain is to the strain used to prepare the vaccine.
 - **Pandemic-specific vaccines** that are developed specifically to protect against the pandemic viral strain, once it has been isolated. Once available, a pandemic-specific vaccine should protect most recipients from clinical illness and may also reduce illness severity, hospitalisation and death and therefore the national impact of subsequent waves of the virus.

Pre-pandemic vaccine

- 4.38 The Government currently holds a limited supply of H5N1 vaccine. This could potentially offer some protection in the event of an increased threat of a new pandemic arising from this highly pathogenic virus (“avian flu”). However, this vaccine would not necessarily be well-matched to the specific pandemic strain once it emerges and so the level of protection offered by the vaccine would not be known until a new pandemic virus emerges.

²⁰ Use of antibiotics in an influenza pandemic. Scientific Evidence Base Review 2011

- 4.39 Taking account of this and the current Joint Committee on Vaccination and Immunisation (JCVI) advice, the Government's policy is that these vaccines, if useful, would be prioritised for the protection of frontline healthcare workers and those in clinically at-risk groups.

Pandemic-specific vaccine

- 4.40 The development of a new pandemic-specific vaccine can only begin once the new pandemic influenza viral strain has been identified and isolated. Arrangements have been put in place by the European Medicines Agency (EMA) to enable manufacturers to conduct studies with prototype pandemic-specific vaccines and seek approval of 'mock up' licences in the inter-pandemic period. These studies mean that the form of pandemic-specific vaccine will already have undergone detailed clinical trials, including safety studies, which allows the new vaccine to be licensed and available for use as quickly as possible.
- 4.41 The production process is highly complex and it is likely to take at least four to six months after the start of a pandemic before a pandemic-specific vaccine would start to become available.
- 4.42 As a contingency measure, the Government is currently in discussion with manufacturers about the possibility of securing new advance supply agreements for a pandemic-specific vaccine to be available as soon as it is developed.
- 4.43 However, it is not realistic to expect that vaccination with a pandemic-specific vaccine will have an impact during the first wave of an influenza pandemic although pandemic-specific vaccines could be an important tool in preventing further cases and protecting the vulnerable, particularly if further waves of infection occur.

Pandemic vaccination programme

- 4.44 Even once pandemic-specific vaccine starts becoming available, deliveries of supplies will be phased over a number of months. The Joint Committee on Vaccination and Immunisation (JCVI) has agreed that the primary objective of a pandemic-specific vaccination programme should be to reduce morbidity and mortality. Therefore, vaccine, once available, would be prioritised to groups of the population to reduce morbidity and mortality as far as may be possible.
- 4.45 JCVI also supported the proposed early use of the vaccine in front-line health and social care workers, given the greater potential exposure to the virus and the possibility of transmitting that infection to susceptible patients or people they were supporting and because this will help to maintain the resilience of the NHS.
- 4.46 CEAPI has previously considered the use and prioritisation of vaccine. They concluded that the most appropriate course of action would depend on the particular

circumstances, including what could be achieved with the amount of vaccine available at the time, and this remains their view following the experience of the H1N1 (2009) influenza pandemic. If it is not possible to limit the spread by achieving herd immunity²¹, where so many people are immune that the disease cannot continue to infect people to maintain itself in the population, it is important to reduce the impact of the pandemic.

- 4.47 Given this advice, the presumption should be that the prioritisation of vaccine will depend on the emerging profile of at-risk groups for a new pandemic virus, with priority given to clinical risk groups and front-line health and social care workers. There are no plans to prioritise vaccine for any other specific groups or sectors for business continuity reasons.
- 4.48 Throughout the pandemic, the case for vaccinating other groups will be based on advice from the JCVI and will take into account factors such as vaccine availability, the specific characteristics of the virus and the potential health benefits of implementing an extended vaccination programme compared to the risk that so doing might pose to other important health programmes, such as the general childhood vaccination programme.

²¹ The primary aim of vaccination is to protect the individual who receives the vaccine. Vaccinated individuals are also less likely to be a source of infection to others. This reduces the risk of unvaccinated individuals being exposed to infection. This means that individuals who are not vaccinated will still benefit from the routine vaccination programme. This concept is called population (or 'herd') immunity

5. Communication and public & professional engagement

- 5.1 There are particular challenges in providing clear information and advice during a pandemic. Scientific knowledge will at first be limited, the pattern of disease spread may be variable across the country, and public concern may be high. Communications also need to reflect the differences of health and other systems across the four countries of the UK.
- 5.2 Consistent, clear public messaging, aligned at national and local level, is critical to a successful and collaborative UK-wide response to a pandemic. This will help to maintain public trust and support, as well as in increasing uptake of recommended actions such as good respiratory and hand hygiene practices, effective and responsible use of antiviral medicines, and uptake of vaccination.
- 5.3 As well as consistency of public messaging, it is vital that communications within and between national and local health and resilience organisations are also clear and consistent. Pandemics require the whole of society to respond, and this response will be improved if everyone has access to the information they need, in a form which works for them. This is not an easy task, but one which all organisations should strive towards.
- 5.4 In conjunction with the devolved administrations, the Government has produced an influenza pandemic communications strategy, which will be published in line with this strategy.
- 5.5 The main aims of the Government's pandemic influenza communications and public engagement strategy remain to:

Explain the outbreak

- Government is responsible for providing accurate and timely information throughout the course of the pandemic to the public, staff and stakeholders.
- In particular, it should ensure that health and social care staff have the right information at the right time to perform their role and enable them to respond to enquiries from the public.

Establish confidence

- Communications should also establish and maintain confidence in the ability of the Government and the health services to prepare and manage an effective response.

Minimise the risk of infection

- Communications will advise people what to do to protect themselves and others and encourage them to modify their behaviour through:
 - Helping them understand the potential seriousness for themselves, their family and society at large and encouraging them to take positive action through hygiene behaviours;
 - helping people to recognise the symptoms;
 - helping them to understand what to do if they get infected;
 - advising people how best to look after themselves and others; and
 - communicating the role of vaccines and antiviral medicines.

5.6 All communication should be high quality and cost effective, using the most efficient and reliable ways of delivering information in a range of scenarios to a variety of audiences so to maximise understanding and encourage appropriate behaviour without causing panic or appearing disproportionate.

Enabling people to share responsibility for preparedness and response

5.7 However well plans for a new pandemic are prepared and implemented by health and other organisations, their overall effectiveness will ultimately depend on the cooperation of individuals and their willingness to follow advice, take personal responsibility for their health and accept responsibility for supporting each other. Government alone cannot mitigate the progression and impact of a pandemic. Rather, it will require people, communities and government to work together and act appropriately to achieve this.

5.8 During an influenza pandemic, the Government will be primarily responsible for the provision of information about the course of the outbreak and for developing plans to deliver treatments and vaccinations.

5.9 Openness and transparency is central to an effective pandemic response. People are likely to respond better and are more likely to take effective and appropriate action if they trust both the advice given and the person or organisation offering it.

5.10 Research also suggests that people are more likely to take up recommended behaviours when they clearly understand the risk the pandemic poses to them (e.g. understanding they could become infected with influenza themselves.) Alongside this understanding of the risk, people need to have access to the tools and information to respond to it. Communications are likely to be most effective when they explain clearly why certain actions are protective and why people are being asked to take them. If individuals understand the risk but do not know how to mitigate it, then this is likely to increase the uptake of non-recommended behaviours, e.g. presenting at a GP surgery

for assessment and treatment – with the attendant strain that this may place upon services.

- 5.11 Additionally, behavioural science indicates that communication should not rely upon an overly linear or ‘rational’ model of human behaviour, where information is provided and people judiciously weigh up the pros and cons of acting on that information. Awareness is not always correlated with action, and approaches such as those outlined in the MINDSPACE report²² should be applied in pandemic communication strategies. For example, demonstrating the normality of having a vaccination could be more effective than focusing on non-compliance as it harnesses the impact of social norms. Messaging should avoid “one-size fits all” approaches and instead be targeted to segments of the population so as to achieve the greatest level of engagement with any communications campaign.

Communications for the public

- 5.12 During a pandemic, the UK Government and devolved administrations will use a wide range of media to communicate information effectively to the public, to engage in discussion and to identify areas of concern. Information may also be made available directly to the public through telephone help lines and other interactive channels. Regular press briefings, key websites and social media and other information channels will be used to reach a wide audience and to encourage responsible, informed reporting.
- 5.13 The four UK health departments are developing new ways of engaging proactively with journalists, the professions, and the public. These include disseminating transcripts of media briefings, using clinician-led podcasts and making more use of social networking and digital technology to reach specific sections of the public. We now have more agile systems that allow us to create online engagement through blogs and webchats. The Digital Emergencies Group that coordinated messaging and content during the H1N1 (2009) influenza pandemic can be quickly re-established using the same structures and processes. However, in future we will increase our digital ‘outreach’ - engaging with people online, in places outside of the Government and NHS web presence.
- 5.14 Communication plans need to remain flexible and pragmatic. They should also be scalable and straightforward to implement. During an influenza pandemic the Government will track public awareness and attitudes through market research to find out how effectively messages are working and to measure engagement. Tracking surveys will help to ensure that the communications messages are reaching all groups of the population and that those who are particularly vulnerable have similar access to advice.
- 5.15 Where possible, communication about regular winter flu should be compatible with core objectives of pandemic communication, encouraging positive behaviours such as good respiratory and hand hygiene practices and vaccination uptake.

²² <http://www.instituteforgovernment.org.uk/images/files/MINDSPACE-full.pdf>

Communication of statistical data in an influenza pandemic

- 5.16 Public health services are responsible for the collection and publication of surveillance and other data relating to public health threats such as a pandemic. Transparent, orderly and proportionate release of data is important to update the public and professionals and to enable open and transparent discussion of complex issues. Where possible this will be on a comparable basis across the four countries. The principles and practices of the Code of Practice for Official Statistics, including for the release of data as well as for reporting standards, will be followed wherever possible during a pandemic and any necessary exceptions will be explained²³. For example, if data need to be published at a time other than 09:30 (the standard time for release under the Code) for practical reasons or to fit better with other communications, this will be announced in advance and a different time fixed.
- 5.17 Any release of statistical information regarding deaths should be balanced against risk to patient confidentiality.
- 5.18 The communication of planning assumptions for the response to a pandemic can pose a particular challenge as they may be perceived, erroneously, to be a prediction of what will happen. They will also change over the course of the pandemic, as they are updated when more information becomes available. Further work is underway to consider how best to communicate risk during a pandemic.

Communications for health and other professionals

- 5.19 Healthcare and other professionals need access to timely and accurate clinical information and advice to enable them to treat patients appropriately. The Royal Colleges and other professional organisations play an important role in this. The UK Government is working with professional bodies and the DAs to identify the best way for health professionals to have access to direct clinical advice during an influenza pandemic through an appropriate website.
- 5.20 Healthcare professionals also play an important role in explaining and reassuring patients about the pandemic and need to have timely and relevant information. The Department of Health will use established mechanisms to alert health organisations to new developments during a pandemic so that they are well placed to deal with enquiries from the public. However, as in other situations, this may not always be achievable where events are proceeding rapidly.

²³ For further information: Statistical Legacy Group – A report for the Chief Medical Officer. Department of Health 2010

Suggested key messages for the public

Preparing in advance

An influenza pandemic is one of many types of emergency that can disrupt normal daily life. Developing a household emergency plan or talking to your family about what you would do in an emergency can help you to prepare and respond to such events.

Ensure that you are routinely vaccinated against seasonal influenza and pneumonia if you are in a high-risk group because you are at greater risk of getting seriously ill.

To reduce the risk of catching viruses, cover your mouth and nose with a tissue when coughing or sneezing, dispose of tissues quickly and regularly wash your hands with soap and water, or use a sanitising gel.

During a pandemic

Follow public health advice and consider how you and your family might prepare for disruption such as closure of schools or childcare facilities due to staff absence or shortages.

Get ready in case you or your family catch influenza by ensuring that you have supplies of normal over-the-counter cold and 'flu medicines and other basic necessities and that you can care for any existing health conditions.

Familiarise yourselves with local arrangements for accessing health and social care support early should you need them, including getting antiviral medicines if needed.

Help friends and family who are ill. They might need you to pick up medicines for them or help in other practical ways.

Be a good neighbour – you may know of those in your community who are more vulnerable than others or could be made vulnerable due to a pandemic. You can help them by checking if they are alright or need help.

If infected with pandemic influenza, stay at home, keep warm and drink plenty of fluids.

If you have influenza and your symptoms are getting worse, or you have a long-term medical condition, you should contact your GP or other health professional for assessment and advice.

Take advantage of pandemic vaccine as soon as possible if you are in one of the risk-groups where vaccination is recommended.

Further advice on how the public can prepare for emergencies can be found at: www.direct.gov.uk/preparingforemergencies

6. The health and social care response

- 6.1 Health and social care services will play a critical role in any pandemic. Although informal care at home will be appropriate and sufficient for most people, NHS and social care services are likely to come under intense pressure compared to other sectors, even in a relatively mild pandemic.
- 6.2 The impact of a new pandemic on health and social care services will vary according to the nature of the virus and its effects:
- A short but severe influenza pandemic may place greater strain on health and social care services than the same number of people becoming ill over a more prolonged time period.
 - Critical care services may be at risk of being overwhelmed in a short severe pandemic, whereas primary care may shoulder the greater part of the burden during a mild, extended pandemic wave.
- 6.3 Further pressures are likely to arise from people concerned about their health in the face of uncertainty and bereavement, by the depletion of the workforce due to sickness and possible logistical and supply difficulties.
- 6.4 In all but a mild influenza pandemic, there may also be particular challenges in maintaining social care services. Estimates suggest that up to 1.7 million adults rely to varying extents on social care support provided by or through local public authorities. In addition to maintaining services for those who will continue to rely upon them, there may also be short-notice demand from people with pandemic influenza who are no longer able to cope independently, and others whose normal care arrangements have been disrupted.
- 6.5 To assist in planning to respond to the challenges posed by pandemic influenza, a supporting document for health and social care providers will be published in line with this strategy.

Initial response – Detection and Assessment phases

- 6.6 The public health services of the four countries, supported by primary care, laboratory services and other health professionals will lead the initial response phase. This will commence when there is an indication of human-to-human transmission of a novel influenza subtype with pandemic potential, which poses a substantial risk to human health.

6.7 The objectives of this phase are to:

- Obtain early information about the effects, risk groups, and transmissibility of the novel influenza virus in order to assess its likely impact and to estimate the potential effectiveness of the clinical countermeasures.
- Provide rapid access to treatment for people with influenza-like symptoms and who have just returned from an infected area or had contact with someone who has.

6.8 The health measures undertaken in this phase are likely to be precautionary in nature. Unless reliable data is available from other countries, the initial presumption will need to be that the virus will produce symptoms of at least moderate severity. Primary care services will also need to support the public health services in the surveillance activity. Therefore, health services will need to plan for an initial, more intensive response to a new virus with pandemic potential. This could include:

- Testing suspected cases.
- Provision of antiviral medicines for treatment and prophylaxis of close contacts of suspected and / or confirmed cases.
- Analysis of serological samples to monitor the pandemic.

6.9 As more becomes known about the characteristics of the virus and the level of risk, plans can be modified to ensure that the response is appropriate and in proportion to the threat as it emerges. It will be important to maintain capacity and energy in the health system to respond to the pandemic over a sustained period.

6.10 Whilst there will be relatively few cases of influenza in the country at this point, public concern will be high and a large number of suspected cases will be identified who subsequently prove not to have the new virus. The pressure on primary care and the level of data gathering activity relating to each suspected case will be considerable and resource intensive.

6.11 The impact of the pandemic virus will vary over time and between regions. Although this will be time limited, some services may still experience periods of severe pressure if hotspots of activity emerge. In these hotspots, primary care and specialist laboratory services will be particularly busy.

6.12 In order to try to reduce pressure on primary care services, national and local communications campaigns will advise the public on self-care, giving clear guidance on when their symptoms need further assessment.

6.13 Business as usual activities should continue for as long as possible except in those areas experiencing local outbreaks. All NHS and social care services will need to review plans at this stage and to prepare to respond quickly in a flexible and proportionate manner.

Treatment phase

- 6.14 Local health services may move into the treatment phase at different times depending on the local service impact of the virus. Localised outbreaks, or “hot-spots” of high activity, may continue to occur, and this will influence the decision to move to the treatment phase in a local area. In general, the severity of the pandemic will shape both the local and national response during this phase.
- 6.15 In the treatment phase, the focus will be on providing rapid access to treatment (e.g. antiviral medicines) for those that need it, in line with clinical advice at the time. The Government’s antiviral stockpiles are likely to be deployed and Antiviral Collection Points (ACPs) may be established where the pressure on primary care is high.
- 6.16 People in at-risk groups may be more vulnerable and likely to call upon health services. The groups most at risk from severe illness will be kept under review as more is learned about the nature of the new influenza virus.
- 6.17 During an influenza pandemic with a mild impact, primary care services will be responding in a similar way to a moderate seasonal influenza outbreak. Business as usual activities would continue for as long as possible except in areas with “hot-spots” of high activity and social care services may remain largely unaffected. Experience from the 2009 (H1N1) influenza pandemic demonstrated that irrespective of the severity of symptoms produced by the virus, the media interest generated significant community concern in a local area that led to significant pressure on local primary care services.
- 6.18 In a moderate or more severe influenza pandemic all health and social care services will be stretched and will need to reduce or cease non-urgent activity in order to make the maximum capacity available to meet the health care needs of those who are severely ill as a result of the influenza virus.
- 6.19 The majority of patients will be cared for in their own homes, which may lead to increased pressure in primary and community services, social care, voluntary agencies and the private sector companies that support these services. In a severe pandemic where most age groups are affected, and many severely affected, it is likely that many sectors will be affected with high rates of sickness and absence.

National Pandemic Flu Service (NPFS)

- 6.20 The NPFS is designed to supplement the response provided by primary care if the pressures during an influenza pandemic mean that it is no longer practical for all those with symptoms to be individually assessed by a doctor or other prescribers in order to access antiviral medicines.

- 6.21 The NPFS comprises an online and telephony self assessment service where individuals are not assessed by a clinician but follow a process of answering questions which have been developed with extensive advice from clinicians, which determine whether the person who is ill is eligible for an antiviral medicine or not. Individuals may also be directed to other health interventions such as home care advice or ambulance response.
- 6.22 A national network of ACPs will be set up so that friends or relatives (“Flu friends”) can collect the antiviral medicine on behalf of the person with influenza, enabling them to remain at home and minimise further spread of infection.
- 6.23 The decision whether and when to activate the NPFS will be taken nationally in the light of the pressures and impact of the pandemic at the time, e.g. close monitoring of the level of consultations with GPs. In a pandemic of mild severity it may not be needed at all. It will take at least three weeks for the necessary arrangements to be put in place for the NPFS to go live. This includes the time required for the systems to be mobilised and for call centre staff to be identified and trained to deal with calls.
- 6.24 The decision to activate the NPFS will be taken at a national level. Thereafter each UK country can decide whether the service should be extended to cover their locality²⁴.
- 6.25 The NPFS is designed to operate as a rapid evidence-based assessment system during an influenza pandemic only when access to antiviral medicines is important as part of the defence in depth strategy given that it involves a new influenza virus emerging to which few, if any, people, have immunity. In such situations, unlike during seasonal influenza, it is expected that the majority of patients presenting with influenza-like illness will be infected with the pandemic virus.
- 6.26 A review of analysis of the operation of the NPFS during the H1N1 (2009) influenza pandemic, *The National Pandemic Flu Service: An evaluation*, is available at www.dh.gov.uk.

Secondary (hospital) care

- 6.27 Although adults with uncomplicated influenza infection do not usually require hospital treatment, patients with worsening pre-existing medical conditions or suffering influenza-related complications such as bronchitis and pneumonia may need hospital referral. Children with severe illness and pregnant women may also need referral for assessment and possible admission.
- 6.28 A pandemic of only mild to moderate impact may still generate intense and sustained activity for health and social care services NHS and social care operational services

²⁴ In Scotland, the Scottish Flu Response Centre (SFREC) at NHS 24 may operate during a pandemic for the assessment of symptoms and potentially to provide access to antiviral medicines. The service could operate either instead of the NPFS or to complement it.

have escalation procedures that are used to respond to increased demand, such as can happen in winter months.

- 6.29 Critical care services are both small and specialist so have limited capacity and capability to expand. They are likely to see increases in demand during even a mild influenza pandemic. In a moderate or severe influenza pandemic demand may outstrip supply, even when capacity is maximised. Plans to increase capacity of these services are an important aspect of planning but, despite this, at times of extreme demand it may become necessary to make decisions concerning priority of access to some services.
- 6.30 During the H1N1 (2009) influenza pandemic, the Swine Flu Critical Care Clinical Group produced a report incorporating key learning points for future surge planning²⁵. This report contains guidance on a number of issues such as supplies, staff training and support. Developing and maintaining these on an ongoing basis is fundamental to resilience in this area.

Escalation

- 6.31 In extraordinary circumstances, such as the emergence of a virus that causes a particularly severe illness, demand may continue to escalate causing acute pressures on all health services, particularly during the peak weeks of an influenza pandemic. Local health services may move into the escalation phase at different times depending on the local service impact of the virus. The timing and requirements will vary according to the spread of the disease.
- 6.32 Influenza viruses can have the direct effect of causing respiratory illness, or an indirect effect of worsening other underlying conditions. The degree to which services will be affected depends upon the characteristics of the new pandemic virus. Specialist or small-scale services, such as intensive care, have limited capacity to expand and are therefore likely to face pressures earlier.
- 6.33 Maximising the use of capacity remains the responsibility of local health organisations. In severe circumstances, it will not be possible to continue “business as usual” activities and an escalating series of actions to reduce non-essential activity will be required in order to prevent service failures.
- 6.34 In more severe circumstances, it may be necessary to prioritise access to some services in an ethically appropriate way. The provision of the best available alternative care in situations of extreme demand will be an important part of the response, as will professional support and close discussion with families.

²⁵ Report of the Swine Flu Critical Care Clinical Group available at:
http://www.dh.gov.uk/en/Publicationsandstatistics/Publications/PublicationsPolicyAndGuidance/DH_117129

Vaccination

- 6.35 Pandemic-specific vaccine is likely to become available within four to six months of the pandemic being declared. The pace of the roll out of a vaccination programme will initially be determined by availability of vaccine; initial deliveries of vaccine are likely to be limited so prioritisation of individuals for vaccination will be needed as outlined in Chapter 4.
- 6.36 The presumption is that it is likely that frontline health and social care workers and the usual seasonal influenza “at-risk” groups will be offered the vaccine first. However, there may be modifications to the list of “at-risk” groups as information is gathered on the nature of the pandemic virus and the groups most at risk of severe illness and death. Decisions on the expansion of the vaccination programme will be based on expert advice from the JCVI taking account of availability of vaccine supplies, extent of the spread of the pandemic virus and severity of illness caused.
- 6.37 Decisions about the priority groups for vaccination will be taken by Ministers of the four countries. The arrangements for implementation of vaccination programmes may be determined and taken forward in each country, including putting in place agreements with primary care or other providers of vaccination in advance of a pandemic. Planning for programmes will begin before the vaccine is available. It is likely that stock will be distributed to local delivery points, and that onward distribution may be needed to GP surgeries and other locations.

Recovery phase

- 6.38 As the impact of the influenza pandemic activity wanes, the UK will move into a recovery phase. Although the objective is to return to inter-pandemic levels of functioning as soon as possible, the pace of recovery will depend on the residual impact of the pandemic, ongoing demands, backlogs, staff and organisational fatigue, and continuing supply difficulties in most organisations. Therefore, a gradual return to normality is to be expected.
- 6.39 Health and social care services may experience persistent secondary effects for some time, with increased demand for continuing care from:
- Patients whose existing illnesses have been exacerbated by influenza.
 - Those who may continue to suffer potential medium or long-term health complications.
 - A backlog of work resulting from the postponement of treatment for less urgent conditions.
 - Possible increased demand for services through post-pandemic seasonal influenza.

- 6.40 The reintroduction of “business as usual” also needs to recognise that there may be reduced access to skilled staff and their experience. Many staff will have been working under acute pressure for prolonged periods and are likely to require rest and continuing support. Facilities, essential supplies, and medicines may also be depleted. Re-supply difficulties might persist and critical physical assets are likely to be in need of backlog maintenance, refurbishment or replacement.
- 6.41 Other sectors and services are likely to face similar problems and may also experience difficulties associated with income loss, changes in competitive position, loss of customer base, lack of raw materials, the potential need for plant and machinery start-up and so on.
- 6.42 Although recovery is characterised as a move back to normality, it is not possible to predict further waves of the pandemic or the shape and impact of the pandemic virus as it becomes a future seasonal influenza virus, which will emerge and which will again require organisations to regroup and respond. In this sense, expectations around the performance of health and social care services should be tempered with a recognition of the experience of dealing with the influenza pandemic.

7. Whole of society response

- 7.1 An effective response to an influenza pandemic relies upon cross-government and cross sector collaboration to manage wider societal impacts and the interdependences between health responses and other sectors.
- 7.2 Influenza pandemics have the potential to impact upon a wide-range of sectors, creating a range of cross-cutting issues. The scale, extent and nature of these impacts and issues are dependent upon the characteristics of the virus, mitigation measures and the way in which people respond and react.
- 7.3 The UK approach for responding to wider societal impacts resulting from pandemic influenza and the interdependencies between wider services and health and social care responses are set out below.

Business as usual

- 7.4 During a pandemic, the Government will encourage those who are well to carry on with their normal daily lives for as long and as far as that is possible, whilst taking basic precautions to protect themselves from infection and lessen the risk of spreading influenza to others (see Chapter 4). The UK Government does not plan to close borders, stop mass gatherings or impose controls on public transport during any pandemic.

Maintaining essential services and normal life

- 7.5 During a pandemic, staff absence is likely to be significantly higher than normal across all sectors. This absence may come from a combination of reasons including fear of infection, personal illness, the need to look after family members who are ill, bereavement, school closures or possible transport difficulties. Levels of absence may vary due to the size and nature of a workplace, the kind of activity that takes place there and the composition of the workforce. Specific planning assumptions on staff absence to help organisations are in Chapter 2 and the following table summarises the key arrangements already in place.

Table 2: Business continuity arrangements

Sector	Arrangements in place
Energy and Fuel	Companies have generic plans in place to maintain supplies of gas and electricity at near-normal service levels in periods of high staff absence. Whilst routine maintenance is likely to be afforded lower priority if there are staffing shortfalls, essential repairs will continue to be carried out.
Water and Sewerage	As many key operations are automated in the water and sewerage industry, companies are confident that they will have sufficient staff to sustain essential operations during a pandemic. Water companies have generic contingency plans for continuity of essential supplies and work with suppliers and contractors to check critical interdependencies such as chemical supplies for water treatment.
Food supply	Companies across the food sector will work together through their representative organisations and the Department for Environment, Food and Rural Affairs (Defra) to maintain supplies as far as possible. However, at the peak of a pandemic, there may be a reduction in choice and accessibility if some local outlets close due to non-availability of staff.
Transport	Public transport operators have plans in place which provide for emergency timetables, redeploying staff and operating revised working (shift) patterns, if required. The aviation sector may also experience difficulties if non-UK airports or airlines have operational problems or stop operating.
Finance	The contingency planning of the finance sector is led and coordinated by the UK financial authorities (HMT, the Financial Services Authority (FSA) and the Bank of England). These share responsibility for maintaining financial stability in the UK. Further information on the financial sector plan for a pandemic is available at www.fsc.gov.uk/section.asp?catid=434
Postal Services	The contingency plans for both Royal Mail and services operated by alternative carriers should ensure that the market maintains critical work and priority delivery services during a pandemic. Any reduction to Royal Mail's services would be overseen in accordance with a list of corporate priorities agreed with the regulator, focusing on those services involving high social responsibility (access to cash/benefits).

Emergency services	As Category 1 responders under the Civil Contingencies Act 2004, emergency services have a duty to have business continuity arrangements in place. Business continuity planning is well developed in emergency services across the UK, and multi-agency exercises have been conducted to test arrangements. These plans should ensure continuation of emergency provision and support to the wider response to a pandemic. Non-emergency functions could be affected by the need to redeploy due to staff absence levels.
Benefits and pension payments	These are largely automated and will continue to be paid. Business continuity arrangements will aim to continue services that support people into work, but will give priority to maintaining financial support.
Education	Universities and Colleges all have their own business continuity plans and will make their own decisions on closures or partial closures based on advice from public health services. The Department for Business, Innovation and Skills (BIS) will provide advice and guidance to the sector bodies (Universities UK, the Association of Colleges, the National Union of Students and the Higher Education Business Continuity Network) as the pandemic develops to enable them to make locally based decisions and to communicate effectively with their staff and students. See page 38 for more on school closures.

- 7.6 To help mitigate the impacts of staff absenteeism organisations from all sectors, critical national infrastructure and government departments should maintain business continuity plans. These plans need to be flexible and scalable to respond to a range of pandemic scenarios, from the mild to more severe. They should aim to maintain business as usual for as long and as far as it is possible. They should at the very least aim to maintain core services and business activities for a number of weeks during the peak of the pandemic.
- 7.7 To ensure business continuity plans are effective, the interdependencies between organisations should be identified and arrangements with key suppliers set up to ensure continued provision of critical infrastructure. Telecommunications networks have the capacity to support a significant increase in home working but the reconfiguration of networks to enable them to handle significant short-term changes in locations and patterns can take time. Organisations planning to increase the proportions of staff that work from home as a business continuity measure should discuss this with their telecommunications providers well in advance to allow them to put the necessary hardware and software in place.

- 7.8 In maintaining business plans organisations should work on the assumption that most of their staff will not have access to vaccines. Access to these countermeasures will need to be Government controlled due to limited and phased supplies. Pandemic specific vaccine will take between four to six months to develop. On the basis of JCVI and CEAPI advice based on an assessment of circumstances at the time, access to these countermeasures is likely to be prioritised, in the first instance, for those at clinical risk.
- 7.9 Businesses who have their own stocks of antiviral medicines should consult their usual occupational health providers on how to best manage their own stockpiles. These providers will be familiar with the individual circumstances of each business and have access to Department of Health advice on the usage of antiviral medicines.
- 7.10 Business continuity arrangements should be regularly exercised and reviewed as part of wider pandemic influenza preparations. The British Standard BS25999 and Business Continuity Institute good practice guides may be helpful in reviewing business continuity and emergency arrangements.²⁶ The Cabinet Office guide, *Natural Hazards and Infrastructure*, provides advice on standards of resilience, business continuity and corporate governance for infrastructure. For Scotland, government advice on Business Continuity Management is available at the Ready Scotland website²⁷.

The role of the military

- 7.11 During a pandemic, the Armed Forces' priority will continue to be to maintain critical military operations. As their own personnel will be equally vulnerable to illness, they may have little or no spare resource to provide Military Assistance to Civil Authorities (MACA). Pandemic resilience plans should not therefore assume that local military units would provide support or have personnel available with either the requisite skills or equipment to perform specialist tasks. Where civil capability or capacity to provide an essential service is exceeded due to a pandemic, and if all other options to provide it have been exhausted, then the Ministry of Defence (MOD) would attempt to provide assistance through the normal processes, if it has suitable resources available.

Health and safety

- 7.12 Employers have a duty to provide, so far as is reasonably practicable, a safe place of work for their workers (in accordance with the amended Health and Safety at Work Act 1974). A pandemic scenario does not alter this duty. Employers should assess the health and safety implications of reduced staffing levels. Risks at work should continue to be managed sensibly and proportionately.²⁸

²⁶ <http://www.thebci.org/gpg.htm>

²⁷ See Preparing Scotland at <http://www.scotland.gov.uk/Topics/Justice/public-safety/ready-scotland/Government/Preparing> and <http://www.scotland.gov.uk/Topics/Justice/public-safety/ready-scotland/Ready/Business> for small to medium sized enterprises

²⁸ Guidance is available on the HSE website at <http://www.hse.gov.uk/biosafety/diseases/pandflu.htm>

7.13 This legislation applies in England, Scotland and Wales. For Northern Ireland, similar provisions are made under the Health and Safety at Work (Northern Ireland) Order 1978.

Maintaining public order

7.14 Whilst the population usually responds in a calm and responsible way to any emergency, a pandemic is likely to cause heightened public concern and anxiety, particularly if the virus causes severe illness or death.

7.15 In a severe pandemic, factors such as pressures on the health services, potential prioritisation of clinical countermeasures, measures to control the spread of infection, possible shortages of basic necessities or short-lived disruption to essential services could result in disturbances or threaten breakdowns in public order.

7.16 Preserving the rule of law, maintaining the democratic process and ensuring public safety will be important elements of the UK's response. Engaging the public in the development of policies, plans and choices, and ensuring that expectations are realistic and that advice and information are readily available prior to and during a pandemic are key elements of planning and should assist in minimising the risk of civil disorder.

7.17 In the event of civil disorder, the Government would rely on existing legislation and normal enforcement measures as far as possible, but may consider the need for additional powers should that become necessary. Response plans should, therefore, anticipate that operational or logistical assistance might be required to support health efforts to control the outbreak or treat patients, or to respond to civil disorder. In this regard, it should be recognised that any request for police support is likely to be in the context of reduced police availability through illness and the need to service similar requests for policing support from other sectors.

The role of the media

7.18 The media has a key role in informing and educating the public about the progress of the pandemic. Accurate, timely and responsible reporting will reinforce important messages, e.g. appropriate health seeking behaviour, and vaccine uptake. Chapter 5 sets out details of the Government's approach to communications during a pandemic.

Managing deaths

- 7.19 The influenza virus can be fatal, often for individuals with other underlying health conditions. A pandemic flu strain is no different and, if severe, could be responsible for a significant number of deaths in a relatively short period of time.
- 7.20 The number of additional deaths expected as a result of a pandemic is impossible to predict ahead of a pandemic. However, in line with Dame Deirdre Hine's recommendation that ministers should decide the levels of deaths for which planning is appropriate, Local Authorities in conjunction with local service providers should ensure that they have plans in place to surge their capacity to cope with an increase in burials and cremations during a pandemic. When planning for excess deaths, local planners should prepare to extend capacity on a precautionary but reasonably practicable basis, and aim to cope with up to 210,000 - 315,000 additional deaths across the UK over a 15 week period (or a higher level where possible). In a less widespread and lower impact influenza pandemic, the number of additional deaths would be lower.
- 7.21 Arrangements should be made for appropriate sharing of data and intelligence regarding additional deaths with partners, such as Local Resilience Fora to enable fellow planners and responders to take action accordingly.
- 7.22 Scottish deaths guidance can be found at: www.scotland.gov.uk/Publications/2009/09/15110710/0. Guidance on the role of faith groups can be found at: www.communities.gov.uk.

Taking legislative action

- 7.23 The legislative framework in place for health protection provides underpinning powers which may be used in response to a future pandemic, should they be necessary.
- 7.24 The details vary in each of the four countries of the UK but include requirements for notification of certain infectious diseases and causative agents, and allow provision to be made should specific, extraordinary health protection measures be necessary.
- 7.25 The presumption is that the Government will rely on voluntary compliance with national advice and that it will not invoke emergency or compulsory powers unless they become necessary, in which case the least restrictive measures that are likely to achieve the objective will be applied first. There is no intention to use legal powers to require people to undergo vaccination or treatment.
- 7.26 The Public Health (Control of Disease) Act 1984²⁹, as amended, which applies to England and Wales, provides powers for a justice of the peace to impose restrictions or

²⁹ For Northern Ireland, similar provisions are made under the Public Health Act (NI) 1967.

requirements (other than vaccination or treatment) on a person, if their behaviour is putting others at risk of significant harm from infectious disease. The Act also allows the Government to make regulations specifically to address a “serious and imminent” threat to public health, if this should arise. This is intended as a contingency provision in the event that legal powers are needed to deal with a substantial threat (such as SARS). Any regulations made could, for example, in extreme circumstances enable a local authority to impose requirements for medical examination, or for isolation or quarantine.

- 7.27 A pandemic could require additional legislative changes in other areas to enable the continuing functioning of essential services, for example changes to regulations governing drivers' hours to maintain critical supply chains.
- 7.28 Departments have identified a series of legislative measures that will or could be required in anticipation of, or during a pandemic in order to enable some of the response measures aimed at mitigating its impact on the UK. In the majority of cases, provision for such amendments is included in existing legislation.
- 7.29 In addition, Part two of the Civil Contingencies Act 2004 established a new generic framework for emergency powers. Emergency powers allow the Government to make special temporary legislation (emergency regulations). However, emergency powers are for use in only the most serious of emergencies when existing powers may be insufficient, and there is not time to either take new powers through the usual route of new legislation, or to see if existing legislation is sufficient. The use of emergency powers is very much viewed as a last resort option and a number of robust safeguards exist to restrict their use. Indeed, it has not been enacted since the CCA came into force. At the centre of these is the triple lock mechanism which ensures that emergency powers will only be available if:
- an emergency that threatens serious damage to human welfare, the environment or security has occurred, is occurring or is about to occur;
 - it is necessary to make provision urgently in order to resolve the emergency as existing powers are insufficient and it is not possible to bring forward a Bill in the usual way because of the need to act urgently; and
 - the emergency regulations are proportionate to the aspect or effect of the emergency they are directed at.
- 7.30 Even if emergency powers are enacted, they are still limited in their scope to the direct amelioration of the effects of the emergency. In addition, emergency regulations are designed to be time bound and will either lapse after 30 days or as otherwise specified in the regulations.

8. Further information

- 8.1 The following documents are being published alongside this strategy:
- Overview of scientific evidence available
 - Scientific evidence reviews available
 - Review of the operation of the National Pandemic Flu Service during the H1N1 (2009) influenza pandemic
 - Communications research from H1N1 (2009) influenza pandemic
 - Equality Impact Assessment
 - Further information on the principles underlying the use of modelling in preparing for an influenza pandemic and some of the results thus far are available
- 8.2 All can be found at www.dh.gov.uk/en/Publichealth/Flu.
- 8.3 Further advice on business continuity aspects is available on the UK Resilience website at <http://interim.cabinetoffice.gov.uk/ukresilience.aspx> and at the Scottish Resilience Ready Business site at <http://www.scotland.gov.uk/Topics/Justice/public-safety/ready-scotland/Ready/Business>
- 8.4 Additional information about generic resilience arrangements in Scotland are available at from the Ready Scotland website at:
<http://www.scotland.gov.uk/Topics/Justice/public-safety/ready-scotland/Government/Preparing>

Acronyms

ACP	Antiviral Collection Point
BIS	Department for Business, Innovation and Skills
CEAPI	Committee on Ethical Aspects of Pandemic Influenza
CMO	Chief Medical Officer
COBR	Cabinet Office Briefing Room
DAs	Devolved administrations
Defra	Department for Environment, Food and Rural Affairs
DH	Department of Health
DfID	Department for International Development
EU	European Union
ECDC	European Centre for Disease Prevention and Control
ECMO	Extracorporeal membrane oxygenation
EMA	European Medicines Agency
EWRS	Early Warning & Response System
FSA	Financial Services Authority
GHSAG	Global Health Security Action Group
HMT	HM Treasury
HPA	Health Protection Agency
HSE	Health & Safety Executive
ICU	Intensive Care Unit
JCVI	Joint Committee on Vaccination and Immunisation
LRF	Local Resilience Forum/a
MACA	Military Assistance to Civil Authorities
MOD	Ministry of Defence

UK Influenza Pandemic Preparedness Strategy 2011

NHS	National Health Service
NPFS	National Pandemic Flu Service
NSC(THRC)	National Security Council (Threats, Hazards, Resilience & Contingencies Committee)
PHEIC	Public Health Emergency of International Concern
PICU	Paediatric Intensive Care Unit
SAGE	Scientific Advisory Group for Emergencies
SARS	Severe Acute Respiratory Syndrome
WHO	World Health Organization

Glossary

Acquired Immunity	Immune defence that develops following exposure to a pathogen (e.g. bacterium or virus) or vaccine. It involves the production of specific defensive blood cells (lymphocytes) and proteins (antibodies), and provides lasting immunity based on the experience or 'memory' of previous exposure.
Aerosol	A gaseous suspension of fine solid or liquid particles which remain suspended in the air for prolonged periods of time.
Airborne	Carried by or through the air.
Airborne transmission	Movement of viral particles through the air either attached to solid particles (such as dust) or suspension in droplets of liquid.
Antibiotic	A type of drug that can prevent the growth of bacteria.
Antiviral medicines	Used to describe a chemical or drug that inhibits virus replication.
Antiviral resistance	The lack of responsiveness of a virus to an antiviral drug, caused by natural variation or as a result of adaptation by the virus.
'At risk' groups	Groups of people who, through their immune disposition or long-term illness (e.g. diabetes, chronic heart or respiratory disease) are deemed to be especially threatened by infection.
Case fatality ratio	The proportion of the population who develop symptoms, ranging from severe to mild during an influenza outbreak and who subsequently go on to die as a result of that infection.
Clinical attack rate (Attack rate)	The cumulative proportion of people infected and showing symptoms over a specified period of time.
Community	The general population, outside of a hospital or clinical environment.
Confirmed cases	Cases of illness that have been confirmed by laboratory analysis.
Countermeasures	Interventions that attempt to prevent, control or treat an illness or condition.
Critical Care	Care of a patient in a life-threatening situation by staff specially trained in recognising and responding to emergencies.
Diagnosis	Specific identification of the illness that is causing a disease or set of symptoms.
Droplet	Airborne particle which is larger than an aerosol and drops quickly to the ground.
Epidemic	The widespread occurrence of significantly more cases of a disease in a community or population than expected over a period of time.

Epidemiological	Relating to the study of the patterns, causes and control of disease in groups of people.
Excess Mortality	The number of deaths that occur during an outbreak and above that expected for the time of year.
Face mask	A protective covering for the mouth and nose.
H1N1 (2009) influenza pandemic	The worldwide community spread of a new H1N1 influenza virus, originating in pigs and entering the human population in 2009.
H5N1	Highly pathogenic avian influenza virus, enzootic in birds in South East Asia.
Hand hygiene	Thorough, regular hand washing with soap and water, or the use of alcohol-based products containing an emollient that do not require the use of water to remove dirt and germs at critical times, eg after touching potentially infected people/objects and before touching others or eating.
Household Prophylaxis	Post-exposure prophylaxis of household contacts with antiviral drugs.
Immune	The state of a person that is protected from a specific type of infection.
Immunisation	Manipulation of the immune system to confer, or bolster, its ability to protect.
Immunosuppressed	A state in which the immune system is suppressed by medications during the treatment of other disorders, like cancer, or following an organ transplantation.
Incubation period	The time from the point at which infection occurs until the appearance of signs or symptoms of disease.
Infection	The acquisition and active growth of a foreign microbial agent in a host, such as a human or animal, usually with a detrimental outcome.
Infectious	A disease caused by a micro-organism that can be transmitted from one person to another.
Infectivity	The extent to which a given micro-organism infects people (or animals), i.e. the ability of the organism to enter, survive and multiply in people and cause disease.
Isolation	Separation of individuals infected with a communicable disease from those who are not for the period they are likely to be infectious in order to prevent further spread.
Mitigation	Strategy to delay of the spread, or moderate the severity or extent, of a pandemic.
Modelling	Use of the mathematical theory of disease dynamics to make a quantitative assessment from available data of the range of possible behaviours of a pandemic and the impact of various responses, most

importantly those that are likely to be both effective and robust over the range of uncertainty.

Oseteltamivir	Antiviral drug, marketed by Roche Pharmaceuticals under the trade name Tamiflu®, that acts by inhibiting Neuraminidase activity and thus blocking viral spread.
Outbreak	Sudden appearance of, or increase in, cases of a disease in a specific geographical area or population, e.g. in a village, town or closed institution.
Pandemic	Worldwide epidemic – an influenza pandemic occurs when a new strain of influenza virus emerges which causes human illness and is able to spread rapidly within and between countries because people have little or no immunity to it.
Pandemic-Specific Vaccine	Vaccine developed against the antigens of the specific viral strain responsible for the pandemic.
Pathogenic	Able to cause disease.
Pre-pandemic vaccine	Vaccine developed, ahead of a pandemic, against antigens of a viral subtype.
Post-exposure prophylaxis	Use of antiviral drugs to prevent infection after exposure to infected contacts.
Prognosis	A prediction of the probable course and outcome of a disease.
Prophylaxis	Administration of a medicine to prevent disease or a process that can lead to disease – with respect to pandemic influenza, this usually refers to the administration of antiviral medicines to healthy individuals to prevent influenza.
Quarantine	Separation of those who are thought to have been exposed to a communicable infection, but are well, from others who have not been exposed in order to prevent further spread.
Relenza®	See ‘Zanamivir’.
Respirator	A face mask incorporating a filter. In this document, it implies a particulate respirator, usually of a disposable type, often used in hospital to protect against inhaling infectious agents. Particulate respirators are ‘air-purifying’ respirators because they filter particles out of the air as one breathes.
Respiratory	Relating to the respiratory system (e.g. the nose, throat, trachea and lungs).
Seasonal epidemic	An epidemic that occurs at a defined time each year, typically in the autumn and winter months in the UK due to climatic or social factors (e.g. the end of school holidays).
Seasonal flu / influenza	Annual period of widespread respiratory illness, typically occurring during the autumn and winter months in the UK, caused by the circulation of a strain of influenza virus that is slightly altered from the previous season.

Screening	Institution of special measures at points of exit/entry into a country to detect individuals who have – or may have – been exposed to an infection as a measure to reduce the spread of infection.
Sero-prevalence	The overall occurrence of a disease within a defined population at one time, as measured by blood tests.
Subtype	Viral strain classified by the versions of Haemagglutinin and Neuraminidase that it possesses.
Surge capacity	The ability to expand provision beyond normal capacity to meet transient increases in demand, eg to provide care or services above usual capacity, or to expand manufacturing capacity to meet increased demand.
Surgical mask	A disposable face mask that provides a physical barrier but no filtration.
Surveillance	The continuing scrutiny of all aspects of the occurrence and spread of disease pertinent to effective control in order to inform and direct public health action.
Suspected cases	Cases of illness identified through symptoms but not confirmed by laboratory analysis.
Swine flu	H1N1 influenza arising in 2009 from pigs and the cause of the 2009 pandemic in humans.
Symptomatic	Showing symptoms of disease or illness.
Tamiflu®	See 'Oseltamivir'.
Transmission	Any mechanism by which an infectious agent is spread from a source or reservoir (including another person) to a person.
Vaccine	A substance that is administered in order to generate an immune response, thereby inducing acquired immunological memory that protects against a specific disease.
Virological	Pertaining to viruses.
Virulence	The capacity of an infectious agent to infect and cause illness.
Virus	A micro-organism containing genetic material (DNA or RNA) which reproduces by invading living cells and using their constituent parts to replicate itself.
Wave	The period during which an outbreak or epidemic occurs either within a community or aggregated across a larger geographical area. The disease wave includes the time during which the disease occurrence increases, peaks and declines back towards baseline.
Zanamivir	Antiviral drug, marketed by GSK Pharmaceuticals under the trade name Relenza® that inhibits Neuraminidase activity, thus blocking viral spread.