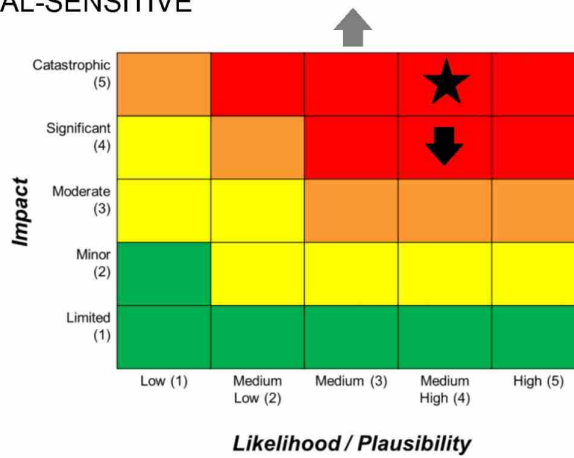


**Disease –
Pandemic Influenza
H23 (DH)**

**Overall Assessment = Very High
Overall Impact Score = 5
Likelihood/Plausibility Score = 4**



Key

- ★ Reasonable worst case scenario
- ↑ Upper range ↓ Lower range

Outcome Description

An influenza pandemic is a worldwide outbreak of influenza, which occurs when a novel flu virus emerges that is different from the circulating influenza strains with sustained human to human transmission. Up to 50% of the workforce may require time off at some stage over the entire period of a pandemic, either because they are ill or caring for someone who is ill, causing significant impact on business continuity in the UK.

Each pandemic is different and the nature of the virus and its impacts cannot be known in advance. Previous pandemics have led to different outcomes. Based on understanding of previous pandemics, a pandemic is likely to occur in one or more waves, possibly weeks and months apart. Each wave may last between 12-15 weeks. Up to half the population could be affected.

All ages may be affected, but until the virus emerges we cannot know which groups will be most at risk. There is no known evidence of association between the rate of transmissibility and severity of infection, meaning it is possible that a new influenza virus could be both highly transmissible and cause severe symptoms. Pandemics significantly more serious than the reasonable worst case are therefore possible.

The reasonable worst case scenario has been developed to inform planning for pandemics and suggests that up to half the UK population may fall ill, which could result in up to 750,000 fatalities. However, it does not take into account the response measures we put in place as the impact of the countermeasures in any given pandemic is difficult to predict as it will depend on the nature of the virus.

Specific Assumptions

The reasonable worst case scenario is based upon the experience and mathematical analysis of influenza pandemics in the 20th and 21st century, the specific assumptions of this scenario are:

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- up to 50% of the population could experience symptoms of pandemic influenza during one or more waves lasting 15 weeks (though more would be expected to be infected);
- a case fatality ratio of up to 2.5% is expected in the reasonable worst case scenario, meaning up to 2.5% of those with symptoms could die as a result of the pandemic;
- up to 4% of symptomatic patients could require hospital care if the virus results in severe illness, 25% of whom are expected to require level 3 critical care;
- peak illness rates of around 10-12% (measured in new clinical cases per week as a proportion of the population) are expected in each of the weeks in the peak fortnight; and
- absence rates for illness will be reaching 15-20% in the peak weeks.

While combining these figures can be misleading and there is unlikely to be both high end illness and death rates resulting in around 750,000 deaths, this is the advised reasonable worst case for guiding planning nationally. This figure has been recommended by the Scientific Pandemic Influenza Sub-Group on Modelling (SPI-M).

Local planners, however, are advised to prepare for up to 300,000 additional deaths across the UK over a 15 week period. This would mean a Local Resilience Forum (LRF) planning for a population of 700,000 should consider planning for around 3,000 additional deaths and an LRF planning for around 7 million for the order of 30,000 additional deaths.

Background

An influenza pandemic is a worldwide outbreak of influenza which occurs when a novel flu virus emerges that is different from the circulating influenza strains with sustained human to human transmission. As the virus is different most of the population have little or no immunity and so it is able to spread easily from person to person. The new virus might infect large proportions of the population over a relatively short period of time at any time of the year.

Influenza pandemics appear to have occurred rarely and randomly throughout human history. Historical evidence indicates that the timing, severity and duration of each episode can be variable and unpredictable. There have been 4 recorded pandemics of influenza during the past 100 years: in 1918, 1957, 1968 and 2009. 1918 was by far the most serious event.

Pandemic	Area of emergence	Estimated Case Fatality Ratio	Estimated mortality attributed to pandemic influenza in the UK
1918/19 Spanish flu (H1N1 strain)	Unclear	2-3%	Estimated 200,000 - 250,000

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There have been four pandemics over the last 100 years – one with a similarly high case fatality ratio to the assumptions here. Therefore, it is judged that the likelihood of this risk is approximately 1 in 20 in the next 5 years.

Likelihood Score = 4

Economic Impact

The main economic impact to the UK comes from the social valuation of the possible 750,000 fatalities. This leads to an economic impact of approaching £1,400 billion.

The possible 30 million casualties/severe casualties (i.e. cases and hospitalisations) would lead to an additional impact of around £700 billion. This includes the lost working hours of those symptomatic contributing ~ £10 billion.

There is an additional, but smaller, impact from reductions in tourism where a severe national event is estimated to result in a loss of around £13.5 billion.

In total the social valuation economic impact would (in the reasonable worst case) is estimated to be somewhere in the order of £2,000 billion.

Economic Impact Score = 5

Fatalities

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. 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, for example the 750,000 deaths projected in the advised reasonable worst case, 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 but still significant increase compared to normal levels.

Fatalities Score = 5

Casualties

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. It is likely to have a significant impact on those with existing illnesses (e.g. respiratory, immuno-

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deficient) and place extreme pressure on the health and social care system, meaning that life-saving treatment for many patients with conditions unconnected to the outbreak might have to be withheld, with social care services similarly affected.

Casualties Score = 5

Social Disruption

An influenza pandemic would cause significant disruption to many sectors of society. These impacts on the wider society would impact on persons of all ages and across both urban and more rural areas.

In general most influenza disease is concentrated in young people. However the severity of illness usually increases with age. In seasonal influenza most serious disease is concentrated in the elderly and at risk groups. This may be the case in a pandemic but severe illness could also be spread across all age groups.

There is an equal risk of disruption in urban and rural areas. The pandemic *may* take longer to become established in rural areas but the variability of impact when cases arise, may create larger disruption to the more limited rural local services.

The anticipated impacts of an influenza pandemic on different areas of society are:

Access to healthcare:

Health and social care services will play a critical role in any pandemic and are likely to come under intense pressure compared to other sectors, even in a relatively mild pandemic. Further pressures will arise due to staff sickness and an increased demand from the public.

In a moderate or more severe influenza pandemic all health and social care services will be stretched, (in particular intensive care) and there will be the 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.

Local decisions are taken incrementally to decrease non-essential services in line with increasing demand, based on admission and critical care clinical guidelines. Cancellation of elective surgery and routine outpatient appointments are well-established first steps in the process of scaling up the healthcare response in an emergency situation. Even allowing for the cancellation of outpatient and elective capacity, NHS facilities would be unable to release sufficient capacity to meet demand in the reasonable worst case scenario or a similarly significant pandemic. Provision will need to be supplemented through mutual aid arrangements with social care providers in the voluntary, private and Local Authority sectors to provide additional care for those who are ill and have no home care provision

The social care system is already under significant pressure, especially with respect workforce, provider capacity, quality and patient flow. An emergency, including an influenza pandemic, would place additional impact on these existing risk areas.

The Health and Social Care Influenza Pandemic Preparedness and Response document⁶⁹ was published in April 2012 and provides guidance on operational aspects of pandemic response in the health and social care sectors.

⁶⁹ Available on the Department of Health website at <https://www.gov.uk/government/publications/health-and-social-care-response-to-flu-pandemics>

(Combined) Psychological Impact Score = 4

Longer Term Impacts

There are no confirmed common long term health effects from influenza, however a small proportion of people recovering from acute influenza may develop Guillain-Barré syndrome. Guillain-Barré syndrome is a rare and serious condition of the peripheral nervous system. It occurs when the body's immune system attacks part of the nervous system. Most cases (60%) are thought to result from an aberrant immune response triggered by a recent infectious disease, including respiratory diseases such as influenza, or vaccination⁷².

Vulnerability Assessment – (Hazards)

Influenza pandemics appear to have occurred rarely and randomly throughout human history. Each pandemic is different and the nature and impact of the influenza virus behind each pandemic cannot be known in advance. The UK retains a 'defence in depth approach' to mitigate the effects of a future pandemic once it begins, but there is no mechanism to mitigate the likelihood of such an event. This is reflected in scoring of the reasonable worst case scenario.

Ranges

More impactful but less likely/plausible alternative scenario

This is based on the observation that Avian Influenza has a case fatality ratio of around 50% in some cases. There is no reason why a pandemic human adapted strain should not have a case fatality rate of above 10%. No such pandemic has been seen in the recent historical record so the 'likelihood' is no more than 1 in 200 for a five year period. The impact however is 'off the scale' (millions of deaths). The box has been extended to more 'likely' events of a 2-10% case fatality ratio.

Less impactful but more likely/plausible alternative scenario

This is based on the lesser pandemics of the 20th Century which had fatalities in the range of tens of thousands rather than the 'hundreds of thousands' of the reasonable worst case but has a greater 'likelihood' of roughly three in one hundred years or 15% in a five year period.

Note that the less impactful example and the reasonable worst case share the same order of magnitude for both impact and likelihood.

Confidence Levels

Statements	Put a X next to the statement which best represents your risk
Very High confidence in the overall assessment based on a thorough knowledge of the issue and includes evidence of a very high quality informed by consistent / relevant expert judgements.	

⁷² <http://www.nhs.uk/conditions/Guillain-Barre-syndrome/pages/introduction.aspx>