

**H23 (DH)**

Overall Assessment = VERY HIGH

Overall Impact Score = Catastrophic (5)

Likelihood Score = Medium-High (4)

**Risk**

Influenza type disease (pandemic).

**Outcome Description**

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.

The reasonable worst case scenario is based upon the experience and mathematical analysis of influenza pandemics in the 20th century:

- Up to 50% of the population could experience symptoms of pandemic influenza during one or more waves lasting 15 weeks.
- Up to 4% of symptomatic patients could require hospital care if the virus results in severe illness, 25% of whom require level 3 critical care.
- Up to 2.5% of those with symptoms could die as a result of the pandemic.
- This scenario informs planning for pandemics but does not take into account the response measures we put in place.
- While combining these figures can be misleading and it is relatively unlikely to have 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.
- 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.

Essential services: An effective response to an influenza pandemic relies upon cross-government and cross sector collaboration to manage wider societal impacts, and the interdependencies between health responses and other sectors. Chapter 7 of the UK Influenza Pandemic Preparedness

duration of about 3.5% of a working year (roughly 1.5 weeks per person absent from work).

Result: A loss of approximately £28 billion (given a UK GDP of about £1.6 trillion).

If only 25% workers were absent, rather than the 50% assumed above, then this loss would be halved. This loss could be mitigated through effective business continuity planning.

Communications: 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 increasing uptake of recommended actions such as good respiratory and hand hygiene practices, effective and responsible use of antiviral medicines, and uptake of vaccination. The Department of Health launched a Communications Strategy<sup>52</sup> in December 2012 which covers health related communication in the stages leading up to a UK pandemic, during a pandemic itself and during the recovery phase. As well as communications with the public the Strategy highlights the need for health and social care professionals to access timely and accurate clinical information and advice to enable them to treat patients appropriately.

Antimicrobial Resistance: It is important that the possibility of sensitivity to existing anti-microbial agents is assessed on the emergence (or re-emergence) of an infection<sup>53</sup>.

In the case of influenza, consideration needs to be made of the effectiveness of antimicrobials in the treatment of bacterial pneumonia to which persons infected with influenza are often more susceptible. Common causative agents are *Staphylococcus aureus* and *Streptococcus pneumoniae*.

### **Specific Assumptions**

- 50% of the population falling ill spread over one or more waves.
- A case fatality ratio of up to 2.5% in a reasonable worst case scenario and a corresponding care hospitalisation demand ratio of 4%, 25% of whom may 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) in each of the weeks in the peak fortnight.
- Absence rates for illness reaching 15-20% in the peak weeks.

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<sup>52</sup> The Strategy is available on the Department of Health website at <https://www.gov.uk/government/publications/communications-strategy-for-uk-flu-pandemics>

<sup>53</sup> Davies, S. C. 2013. Annual Report of the Chief Medical Officer, Volume Two, 2011. Infections and the rise of antimicrobial resistance. Department of Health, London. <http://media.dh.gov.uk/network/357/files/2013/03/CMO-Annual-Report-Volume-2-20111.pdf>

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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'.

The UK influenza Preparedness Strategy, launched in November 2011, can be found at: <https://www.gov.uk/government/publications/responding-to-a-uk-flu-pandemic>

### Government or external research (existing or new)

The scientific evidence base reviews underpinning the UK Influenza Pandemic Preparedness Strategy were published in 2011 and were further updated in 2014 in relation to: the use of antivirals in an influenza pandemic; the impact of mass gatherings on an influenza pandemic; the use of facemasks and respirators during an influenza pandemic; and the impact of school closures on an influenza pandemic. The reviews were commissioned by the Department of Health and undertaken by Public Health England and can be found at:

<https://www.gov.uk/government/publications/review-of-the-evidence-base-underpinning-the-uk-influenza-pandemic-preparedness-strategy>

Expert judgements – A Scientific Pandemic Influenza (SPI) advisory committee and a SPI-Modelling (SPI-M) advisory committee have advised on the scientific evidence and reasonable worst case scenario.

### **Likelihood**

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.

**Score = 4**

### **Economic Impact**

Fatalities and casualties - £40 billion

Absenteeism - £42 billion

A pandemic is estimated to cost 1.8% of the year's GDP in addition to the cost of absent workers (based on World Bank estimate for rich countries)

Impact on tourism - £27 billion

**Score = 5**

### **Fatalities and 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 20<sup>th</sup> century. This suggests that, given known patterns of spread of infection, up to 50 per cent of the population could experience symptoms of pandemic

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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-deficient) and place extreme pressure on NHS services, meaning that life-saving surgery or treatment for many patients with conditions unconnected to the outbreak might have to be withheld.

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. 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.

**Fatalities Score = 5**

**Casualties Score = 5**

### **Social Disruption**

The social disruption resulting from pandemic flu may include:

- Disruption to the international travel network, over which the UK will have little control.
- A potential loss of over 5% of the national demand for fuel and gas for between 1 day and 1 week.
- There would be little or no impact on electricity supply.
- Closure of local businesses for a number of months due to absenteeism.
- Major disruption to the schooling system with closures and high levels of absenteeism from staff and pupils.
- There would be little or no impact on the environment: land, water and air.
- There would be large scale disruption to the courts and justice system. Essential/urgent cases will be prioritised but there will be delay to non-urgent.
- Possible national major public disorder lasting 2-3 days (or longer, related to the availability of medicines and stockpiling of food stuffs).
- Nationwide suspension of elective procedures.
- Possible national disruption to the distribution of medicines for over 1 month.