

Scientific Advisory Group for Emergencies: NSRA Pandemic Influenza planning assumptions compared with Covid-19

1 <sup>st</sup> Order Assumptions	Pan Flu reasonable worst case, based on a 2016 population, including confidence intervals where possible	Covid-19 current estimates, including confidence intervals where possible
<b>Incubation period</b>	Short incubation period – 1-3 days	Range remains 1 to 14 days, with average of 4-5 days
<b>CFR (symptomatic cases)</b>	2.5%	Uncertain but planning on the assumption 2-3%
<b>Basic Reproductive Rate (<math>R_0</math>)</b>	No number included in planning assumptions	Estimated 2-3 in Wuhan Unknown in other Chinese regions and internationally
<b>Doubling Rate</b>	No number included in planning assumptions	4-5 days in China
<b>Duration of Illness</b>	Assumes normal flu profile – most people back to normal activities in 7-10 days	Median of 15 to 18 days for severe cases, but great uncertainty around this. Longest time so far appears to be 41 days (from onset of illness to death).
<b>Duration of infectivity</b>	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.	Duration of infectivity likely to vary depending on severity of individual cases. 14 days as upper limit. Peak infectivity is probably around the start of symptom onset, average 2-6 days, then falling off rapidly.
<b>Transmission</b>	Sustained human-to-human transmission.  Around a third of infected people are asymptomatic.	Human-to-human transmission outside China has occurred. Sustained human-to-human transmission outside China cannot be ruled out, but there is as yet no definitive evidence of a sustained outbreak/epidemic elsewhere.  Asymptomatic transmission cannot be ruled out and transmission from mildly symptomatic individuals is likely.
<b>Waves/ Duration</b>	The pandemic will come in multiple waves (up to 3), each approximately 15 weeks long with the peak at week 6 and 7 of each wave.	The most likely duration of a UK epidemic is 2-3 months to peak.

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2 <sup>nd</sup> Order Assumptions	Pan Flu reasonable worst case, based on a 2016 population, including confidence intervals where possible	Covid-19 current estimates, based on a 2016 population, including confidence intervals where possible
<b>Cumulative attack rate (proportion of symptomatic population)</b>	50% (32,800,000) of population infected and experience symptoms during one or more waves (based on 1957 and 1968 flu pandemics). Actual number of infected people will be higher as there are a number of asymptomatic cases.	80% (52,480,000) of population possibly infected, <u>however not all of these will experience symptoms</u> . Population infected with symptoms is unclear and to be determined.
<b>Workforce absences</b>	17-20% in the peak weeks. Anticipated that 50% of workforce may require time off at some stage over the entire period of a pandemic either due to illness or to care for others This would be higher were schools to be closed. An average absence duration of 7 to 10 days.	Unknown, use pan flu planning assumptions.
<b>Numbers requiring assessment at health services</b>	9,840,000 would require assessment by health services. This is 30% of all those that are symptomatic.	Unknown, use pan flu planning assumptions.
<b>Hospital cases</b>	1,312,000 would require hospital care, i.e. average six-day length of stay. This is 4% of all those that are symptomatic.	Unknown, but possibly in the region of 4% (1,312,000), as per pan flu planning assumptions.
<b>Hospital critical care</b>	328,000 require the highest level of critical care (require intensive care for 10 days). This is 1% of all those that are symptomatic.	Unknown, but possibly about 1%), as per pan flu planning assumptions.
<b>Excess deaths</b>	820,000 (calculated using the CFR of symptomatic cases)	Unknown, use pan flu planning assumptions.
<b>Clinical Counter measures</b>	<ul style="list-style-type: none"> <li>Antivirals (AV)</li> <li>Antibiotics (AB)</li> <li>Pandemic specific vaccine (PSV)</li> </ul>	None
<b>Vaccine Development</b>	It is likely to take at least six months after a novel virus has been identified and isolated for an effective pandemic influenza vaccine to become available from manufacturers.	None likely to be available in a UK epidemic

**Latest SPI-M modelling summary:**

- The epidemic is close to peaking in Wuhan, around 2.5 months after it began in early December 2020. The peak in the rest of China could be around 1 to 2 months behind Wuhan, but uncertain.
- Outside China, case numbers correlate with air travel volumes from China.
- Assuming the reproduction number is greater than 1 in the UK, an epidemic in the UK could be expected to grow over a period of 2 to 3 months, but there is low confidence around this. The UK is likely to be impacted as a whole, with only small delays between regions.

SAGE secretariat, **I&S** 12 February 2020