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**SPI-M-O's statement on the impact of possible interventions to delay the spread of a UK outbreak of 2019-nCov**

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This is SPI-M-O's statement on the possible impact that potential interventions could have in **delaying** the spread of a UK epidemic of 2019-nCoV, were there to be widespread outbreaks in other countries. SPI-M-O were asked to consider whether any combination of these interventions would be expected to delay the start of a UK pandemic (or its peak) by a month.

SPI-M-O's view was the impact of any intervention would be highly dependent on the patterns of transmissibility of the virus. As this is poorly understood at present, the impact of interventions is hard to determine. SPI-M-O's view was that the impact of any individual interventions would be expected to be relatively small, and none would be expected to delay a UK epidemic by a month. The following interventions were judged to have a greater potential to delay a UK pandemic:

- Restricting travel from countries with outbreaks (if there is not unseen sustained transmission in the UK at present)
- Quarantine of those people returning from China
- Mass closures of schools early in a UK epidemic (if children are responsible for high levels of transmission and there are significant levels of asymptomatic transmission)
- Voluntary home isolation of those with respiratory symptoms or their household contacts (if there are significant levels of asymptomatic transmission).

Whilst it is possible that a combination of these could produce a meaningful delay in a UK epidemic, uncertainty is even greater when the interaction of combinations of interventions is considered. As such, no meaningful conclusions could be drawn as to whether it is possible to achieve a delay of a month. Members were asked to consider this request from SAGE when modelling in the immediate future.

**These possible interventions do not reflect government policy. This list has neither been seen nor approved by ministers.**

<b>Restrictions on travel into the UK from countries with outbreaks</b>	Based on current information on doubling times from China, the <u>average</u> delay expected to result from a 90% reduction of travel from China may be up to two weeks. Because the importation of infected people is a random and continuous process, travel restrictions modify the probability of epidemic onset dates rather than guaranteeing them.  Lower levels of travel restrictions would have a much smaller impact.
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	<p>It is possible that there may already be unseen sustained transmission in the UK, in which case travel restrictions would have no impact.</p> <p>Only restricting direct travel from China (or other countries with sustained epidemics) would have less of an impact than doing so from all countries, as infected people could still travel to the UK via third countries.</p>
<b>Restrictions on travel into the UK from all countries</b>	As above
<b>Restrictions on travel within the UK</b>	<p>Even very substantial reductions in internal travel between localities would have a negligible effect on the length and peak size of the epidemic in each local area. However, coupled with the elimination of international travel, they could spread out a national epidemic by desynchronising the epidemics in local areas. Such restrictions are probably impractical. More realistic reductions in such travel would have a negligible effect on the national epidemic.</p> <p>Imposing travel restrictions from a UK city with a cluster of cases would not be expected to have a meaningful effect.</p>
<b>Quarantine of those returning from China or other affected countries, voluntarily or otherwise.</b>	<p>Similar impact to restricting travel. The impact of quarantining those coming from China will be lessened if there are already outbreaks elsewhere.</p> <p>The success of quarantine would require the identification of everyone coming from affected countries, including via third countries which is likely to be difficult.</p>
<b>Mass closure of schools</b>	<p>The impact that would be seen against 2019-nCoV is highly uncertain. It would be most effective if children have a large impact on transmission, but it is not known at present whether this is the case for 2019-nCoV. The impact of mass school closures would be greater if there is significant levels of asymptomatic transmission among children.</p> <p>If mass school closures were effective with 2019-nCoV, their timing would be important. To <u>delay</u> a UK epidemic, they would be most useful early on in order to reduce community transmission. To <u>reduce the overall attack rate</u>, or lower the peak attack rate, they are normally most effective just before the local peak of the epidemic and when timed around school holidays.</p> <p>In theory, mass school closures could increase the overall attack rate if done at the wrong time.</p> <p>Mass school closures have a large cost in terms of parental absenteeism as well as foregone education.</p>

	<p>If schools are closed it will be important to discourage the gathering of children into school-like childcare settings e.g. mass childcare provision by employers. If infections are more severe in older people, then there could be negative consequences if school closures result in grandparents caring for children.</p>
<b>Restrictions on mass gatherings</b>	<p>Little direct evidence is available on the effects of cancelling large public events.</p>
<b>Mass university closures</b>	<p>As the relationship between age and transmission is currently unknown, it is hard to judge the extent to which mass university closures would slow the epidemic in the UK. As fewer people attend university than school, it would be expected to have a lower impact than mass closures of schools.</p> <p>We do not know what impact the reactive closure of individual universities in response to clusters of cases would be as there has been little research in this area. The impact would depend on subsequent behaviour, for example whether students remained in halls of residence or returned home.</p>
<b>Contact tracing of cases</b>	<p>This is critically important in early cases to gain an understanding of disease dynamics, particularly to answer questions about transmission, including asymptomatic transmission.</p> <p>We do not know what the impact of contact tracing would be on delaying the epidemic in the UK.</p> <p>Contact tracing is not practical once there are large numbers of cases. It also has a high opportunity cost.</p>
<b>Voluntary home isolation of those with respiratory symptoms</b>	<p>Voluntary home isolation, i.e. people staying at home if they show respiratory symptoms, will decrease the number of contacts between infected and uninfected individuals, and is likely to result in a small decrease in the spread of infection.</p> <p>The impact of voluntary home isolation would depend on the route of transmission. It would be somewhat lower if there were significant levels of asymptomatic transmission</p>
<b>Voluntary home isolation of household contacts of those with respiratory symptoms</b>	<p>As above</p>
<b>Encouraging the wearing of facemasks</b>	<p>The wearing of facemasks by the general population is unlikely to meaningfully reduce transmission.</p>

<b>Basic public health advice such as handwashing</b>	This would be expected to slow transmission, but it is unclear by how much.
<b>Effective antivirals (not applicable – included as a placeholder)</b>	n/a
<b>Effective antibiotics (not applicable – included as a placeholder)</b>	n/a
<b>Effective vaccination (not applicable – included as a placeholder)</b>	n/a
<b>Combinations of these</b>	The impact of combining different interventions is even more uncertain than the impact of each one individually. Some of them may reinforce one another increasing any resultant delay, but some may reduce the impact of others, for example, school closures may bring children into contact with people in voluntary self-isolation.