COVID-19: Behavioural and social interventions

Published Thursday, March 26, 2020 Grant Hill-Cawthorne

On 20th March, the Scientific Advisory Group for Emergencies (SAGE) released the evidence behind the government response to Coronavirus disease (COVID-19). This series of short articles summarises these 32 documents. You can view all our reporting on this topic under COVID-19.

- **This article goes over proposed non-pharmaceutical interventions.**
- **These include social and behavioural interventions such as school closures, home isolation, quarantine, and social distancing.**
- **This article summarises 4 SAGE reports.**

Potential effect of non-pharmaceutical interventions (NPIs) on a COVID-19 epidemic in the UK (26 February 2020)

Read the SAGE report

This was the first report on behavioural and social interventions, what society can do (versus drugs or vaccines) for the epidemic. Further updates as data emerged are given below.

The paper considers what happens in an unmitigated response. The NHS would not be able to keep up with demand. Therefore, the aim of behavioural and social interventions should be to delay and/or reduce the size of the peak. In the media this has been called “flattening the curve”. This will extend the duration of the pandemic. The following four measures are discussed:

- School closures.
- Home isolation of symptomatic people (cases).
- Voluntary household quarantine.
- Social distancing.

Out of these measures, school closures, home isolation, and household quarantine were considered for early implementation and lasting for 13 weeks.

These are summarised in a table in the report, and listed under the individual headings below.

School closures

Based on the assumption that children are important in transmission, all schools would need to close. By itself this measure is unlikely to contain the outbreak but would delay the peak by up to 3 weeks. 8 weeks' closure might reduce the peak number of cases by 10% to 30%. Or by 30% if universities closed as well.

It was noted that school closures would most impact those in lower socioeconomic groups as children in these groups are dependent upon the social care that schools provide.

Isolation of cases

Based on the assumption that 65% of people with symptoms stay at home for 7 days. Isolation would reduce their non-household contacts by 75%. It may lead to a 2 to 3 week delay of the peak and reduce the overall number of cases by 15% to 25%.

This was thought to be the easiest measure to explain to the public.

Household quarantine

Later referred to under the umbrella of self-isolation. After one person develops symptoms in a household, all household members stay in for 14 days. While this would double household contacts, it would reduce non-household contacts by 75%. Assuming that 50% of households comply. This measure would have a similar impact as isolating cases but may reduce the number of cases by 20% to 30%.

Social distancing

Every household and workplace reduces their contacts by 75%. School contact rates remain the same. Assumes that workplace contact rates decrease by 25% and household contact increases by 25%. This measure was thought to have the largest impact of all of the measures. Would delay peak by 3 to 5 weeks and reduce the peak by 50% to 60%.

It was acknowledged that this would be broadly supported by the public. But it would be difficult to reduce non-essential contact.

SPI-B insights on combined behavioural and social interventions

Read the SAGE report

On 4th March, SPI-B (the independent group studying behaviours) gave their view on combining these behavioural and social interventions. The concern was that school closures would be very disruptive. They are also likely to impact different socioeconomic groups unequally.

It was felt that isolation of cases and at-risk members of the public would be the most tolerable measures. The next step would be implementing social distancing. There was a lack of evidence on how each intervention would lead to an additive effect.

In particular, concerns were raised around school closures. These included:

- Risk of displacing activity e.g. children flocking to parks and playgrounds.
- Increase in people not complying and financial/societal impacts.
- Isolating grandparents whilst closing schools may prevent key workers from working.
- Single parents would not be able to home-school if isolated due to being unwell.
- Concurrent loss of benefits for poorer children. These include loss of income, increase household bills, loss of free school meals.
- Unintended consequences from reduced or changed adult oversight of children.

Communication

60 to 80% of people feel that banning mass gatherings will be effective. Therefore, the group expected questions from the public as to why this wasn't done right away.

There were some recognised difficulties when trying to find simple phrases to communicate strategies. For example, households may be a physical grouping or may also include halls of residence, or close-knit groups. Public gatherings vary in size and restrictions need to be applied equally.

Other considerations

- Household isolation will financially impact more on poorer families.
- There is likely to be an added mental health burden of quarantine on poorer families.
- There are difficulties around setting a clear age-based limit for self-isolation (e.g. those over 65).
- Schools provide a range of other services to children such as:
    - Emotional support.
    - Education on hand hygiene and other measures.
    - Social services (such as free school meals).
    - Leadership and communication for communities.

Potential impact of behavioural and social interventions on an epidemic of COVID-19 in the UK (9 March 2020)

Read the SAGE report

Following the previous advice, SAGE produced a paper on 9th March. This outlined the impacts of behavioural and social interventions. In this paper **SAGE recommended the following steps**:

1. Individual home isolation of people with symptoms.
2. Household isolation where one member has symptoms.
3. Social distancing of people over the age of 70 (increased from 65 years in the previous paper).

The objectives of implementing these were to:

1. Contain the outbreak, preventing an epidemic.
2. Delay the peak until after winter.
3. Reduce the size and/or delay the peak.
4. Reduce the total number of deaths by protecting vulnerable groups.

On 9th March it was recommended that **steps 1 and 2** start in the next 2 weeks, **and step 3** 2 to 3 weeks later. It was expected that these interventions would need to be in place for 2 to 3 months.

A key figure (Fig 1) was included in this paper. The figure shows the number of new COVID-19 cases over time, in different scenarios.

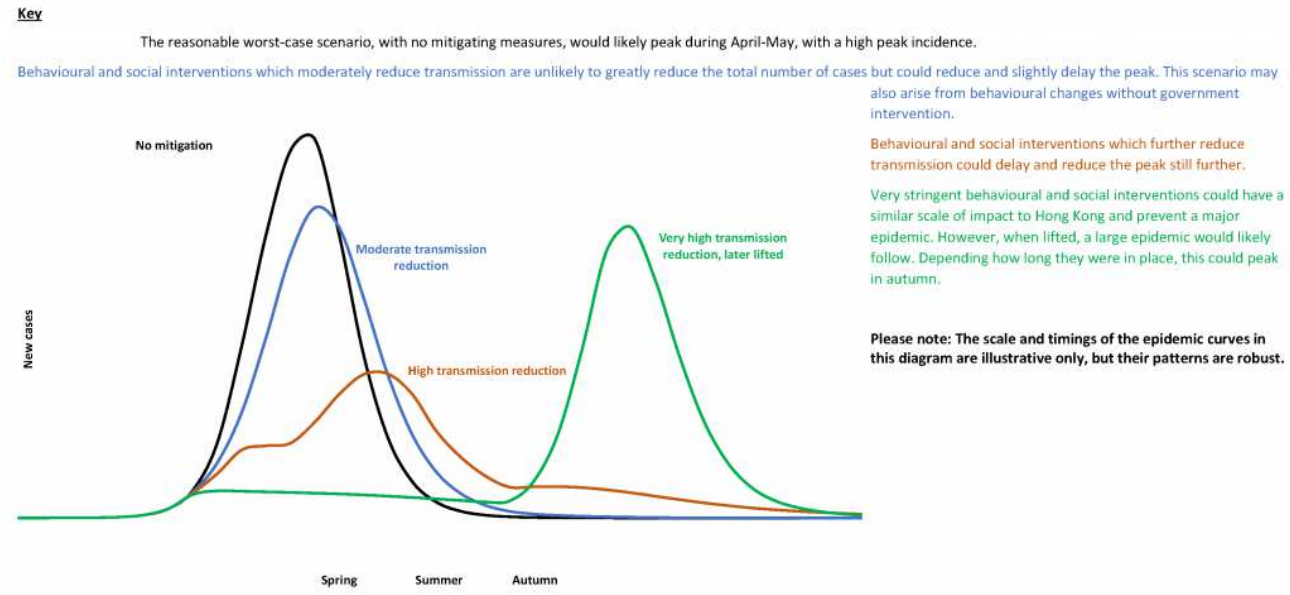


Figure 1. Modelled impacts of moderate, high and very high transmission reduction on the epidemic curve of the outbreak

Here we can see what reducing the size of the peak, commonly referred to as “flattening the curve” looks like. The figure illustrated the balance between moderate interventions (blue) and stringent ones (green). The risk of introducing stringent interventions too early is delaying the outbreak without significantly flattening the curve. A high peak could simply occur in winter, at a time when the NHS is traditionally under the greatest strain.

Wuhan implemented quarantine and movement restrictions on 23rd January. This may have reduced R0 (the Reproduction number: the average number of people infected by each single infected person) to below 1, stopping transmission. But it is not clear what factors lead to this. It is also possible that this approach will lead to the green curve above. Hong Kong and Singapore used extensive contact tracing with school closures and self-isolation. This appeared to have kept R0 at about 1.

The paper then considered **six key interventions:**

1. Stopping large events.
2. School closures.
3. Home isolation of ill people.
4. Whole household isolation when one is ill.
5. Social distancing for all.
6. Social distancing for older people.

Most of these measures would need to be in place for 8 to 13 weeks, except social distancing for older people which would be in place for 17 weeks.

The impacts of each of these measures can be summarised as follows:

1. **Stopping large events:** very little impact.
2. **School closures:** may delay the peak by 3 weeks, and reduce peak cases by 10 to 20%, minimal impact on reducing total cases and deaths.
3. **Case isolation:** similar impact as school closures. More effective at reducing peak cases (could reduce peak cases by 20%).
4. **Whole household isolation:** reduces peak cases by 25%. Less than 10% impact on total cases and deaths.
5. **Widespread social distancing across the population:** substantially reduces peak by 50 to 60%. Reduces deaths by 20 to 25%.
6. **Social distancing only for those over a particular age:** reduces peak by 25 to 35%. Impact differs by age group chosen
    1. 65+ year-olds: 5% reduction of peak, 20 to 35% reduction in deaths.
    2. 70+ year-olds: 15 to 35% reduction in deaths.
    3. 80+ year-olds: 5 to 15% reduction in deaths.

Combining social distancing of older people with isolation of cases would lead to a 45% to 55% reduction in peak cases and 30% to 45% reduction in deaths.

Combining these two with whole household isolation would lead to a 50% to 70% reduction in peak cases and 35% to 50% in deaths. In this combination, there was little difference between targeting over 65 year-olds and over 70 year-olds.

Public appetite for interventions

1. **Stopping large events:** 62% of the population expects major sporting events to stop.
2. **School closures:** 70% to 90% of parents supported measures in previous incidents.
3. **Case isolation:** 84% of the population supports mandatory quarantine.
4. **Household isolation:** no data.
5. **Widespread social distancing:** 16% of the population already avoid shaking hands. During the 2009 influenza pandemic, 50% agreed that avoiding crowds would help.
6. **Social distancing of elderly:** no data.

A few other considerations were put forward:

- Compliance with home isolation in previous outbreaks has been 50 to 90%.
- Need to focus on clear communication:
    - Reasons for each intervention.
    - Clear messaging around isolation.
    - How to frame cocooning/shielding of vulnerable people.
- Frustration for people that can’t work from home.
- Isolation of at-risk groups: advice would need to be provided by health condition, presence of other household members would need to be considered, as would mental health.

Data and assumptions

The figures given for effectiveness of the interventions were based on modelling work. This assumed that 90% of people with symptoms will be detected and infected individuals will transmit the disease to an average 2 to 2.4 other people (2<R0<2.4). Triggers for implementing the next step were put in place based on numbers of cases. For example, one trigger could be reaching 100 cases per 100,000 people per week. The next when 300 cases per 100,000 people per week is reached.

SPI-M-O: Consensus view on behavioural and social interventions (16 March 2020)

Read the SAGE report

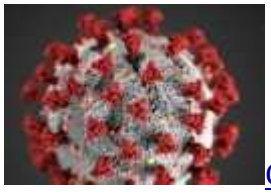
Based on all the above information, the modelling group provided an updated assessment on 16th March. Three interventions (case isolation, household isolation, and social distancing of vulnerable groups) were considered. These alone would be very unlikely to prevent critical care services being overwhelmed.

The evidence was not conclusive on whether social distancing for all would stop the epidemic. However, this combined with school closures for an extended period might.

Alternating periods of more or less stringent social distancing may maintain critical care capacity. This system would be in place for a year, with strict conditions for half of that time. It will take 2 to 3 weeks to see the impact of these interventions.

You can find more content from POST on COVID-19 here.

You can find more content on COVID-19 from the Commons Library here.

-  COVID-19: CURRENT UNDERSTANDING
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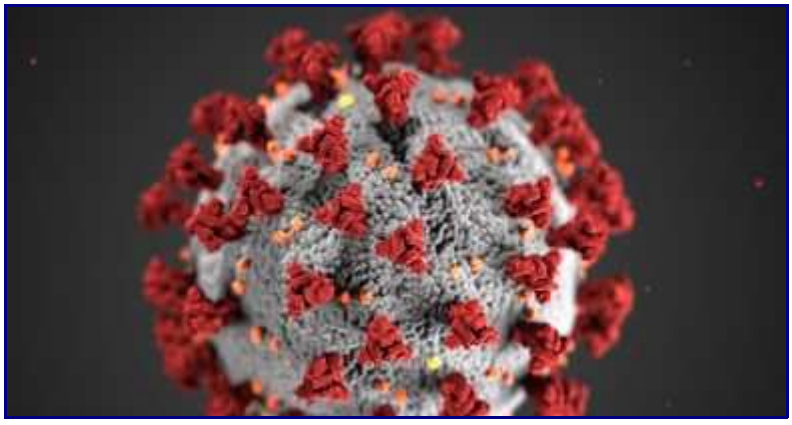

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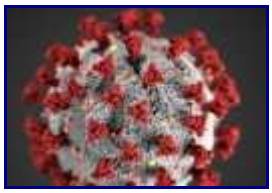

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