

Seventieth SAGE meeting on Covid-19, 26th November 2020
Held via Video Teleconference

Summary

1. Estimates of R and growth rates have fallen slightly in recent weeks. Latest estimates will partially reflect the impact of the national restrictions introduced in England on 5th November and recent changes in the devolved administrations, but the full impact cannot yet be evaluated. The latest estimate of R for both the UK and England is 0.9 to 1.0, while the daily growth rate estimate for new infections is -2% to +1% in England and -2% to 0% for the UK. The estimates for England may continue to decline in future weeks, as the full impact of the interventions is seen. Estimates of R for Scotland, Wales and Northern Ireland are all 0.8-1.0.
2. CO-CIN analysis shows a reduction in hospital mortality rates for patients with COVID-19 in the UK over the course of the first wave. Factors which may account for the reduction in mortality may include: case-mix of patients presenting to hospital; reductions in caseload enabling higher staff to patient ratios; changes to community and hospital practice, in particular the significant increase in the use of non-invasive ventilation; and the impact of drug and other treatment trials.
3. Viral dynamics, contact patterns and environmental factors all contribute to transmission risk. The average risk of transmission correlates with the closeness of social interactions: the average per-contact risk is lowest for community exposures, intermediate for social and extended family contacts, and highest in the household. The number of community or social network contacts can be very high such that these lower risk exposures may comprise a high proportion of the risk. Whilst an individual sector or setting may represent a relatively low risk or account for a relatively small amount of transmission on its own, these risks combine to create greater risks at the community or population level.
4. Avoiding social contacts for a period greater than the typical SARS-CoV-2 incubation period (which is around 5 days) before meeting older or vulnerable people at Christmas will reduce the risk to them. A longer period (e.g. a week or more) would reduce the risk further. This point should be considered in relation to families and preparation for Christmas. This is also relevant for other celebrations and observances and beyond the Christmas period.
5. Repeated rounds of testing for population case detection would have more impact than a single round. The benefit of later rounds is smaller than for the first round, particularly if the same people are more likely to come forward for testing in each round.
6. If used appropriately, lateral flow testing may reduce the risk associated with certain activities but will not eliminate it. It should not be seen as a way on its own of enabling high-risk activities to resume but could reduce the risk of open activities. Test technologies need to be matched carefully with use cases. Behavioural impacts of receiving a negative test result need to be considered in all use cases, as these may be important for the overall impact of testing.

Situation Update

7. Estimates of R and growth rates have fallen slightly in recent weeks. The latest estimate of R for both the UK and England is 0.9 to 1.0, while the daily growth rate estimate for new infections is -2% to +1% in England and -2% to 0% for the UK. The estimates for England may continue to decline in future weeks, as the full impact of the interventions is seen. Estimates of R for Scotland, Wales and Northern Ireland are all 0.8-1.0.
8. The R and growth rate estimates rely on lagged data, mask wide regional variation in the number of new infections and cannot fully reflect recent changes in transmission that

might have occurred in the past two to three weeks. Latest estimates will partially reflect the impact of the national restrictions introduced in England on 5th November and recent changes in the devolved administrations, but the full impact cannot yet be evaluated. The estimates should therefore be treated as an indication of the general trend.

9. The epidemic in the North West of England continues to shrink, with an R estimate of 0.7-0.9 in that region. However, incidence and prevalence there remain high. In other regions of England, R estimates are close to 1.
10. Estimates from SPI-M using data up to 24th November suggest that there are between 41,000 and 70,000 new infections per day in England. This is slightly lower than last week's estimate. The ONS infection survey estimates that from 15th to 21st November an average of 633,000 people had COVID-19 in the community in England, which is also slightly lower than the previous week.
11. Comparing medium-term projections produced in October with subsequent observed data shows that the data have followed the medium-term projections relatively closely, particularly for the earlier weeks. These projections did not account for behaviour or policy changes and were based on a continuation of the prevailing trends at the time. As interventions have been implemented, the observed data for hospitalisations and deaths in more recent weeks have been lower than the projections. The projections suggest what might have happened in the absence of changes.
12. New medium-term projections were not considered this week, as they would not be able to reflect the expected changes to interventions.
13. CoMix analysis suggests that in Wales and Scotland, R has increased and is above 1. This is based on behavioural data which may provide an earlier indicator of potential increases in transmission, though the confidence intervals are much wider than for estimates based on multiple sources such as those provided by the SPI-M consensus. The most recent ONS infection survey data in Scotland show an increase in prevalence, whilst in Wales they show a decrease. In Northern Ireland CoMix estimates that R is well below 1, and ONS infection survey also shows a decrease in prevalence.
14. CO-CIN analysis shows a reduction in hospital mortality rates for patients with COVID-19 in the UK over the course of the first wave. This may be partially accounted for by the case-mix of patients presenting to hospital changing towards a younger and less comorbid demographic, but mortality rates are down amongst all age groups and so other factors will have contributed.
15. Other factors which may account for the reduction in mortality may include reductions in caseload enabling higher staff to patient ratios, changes to community and hospital practice, in particular the significant increase in the use of non-invasive ventilation, and the impact of drug and other treatment trials.
16. SAGE continues to be very supportive of clinical trials and noted the great importance of recruitment into trials at this point in the epidemic.

ACTION: Calum Semple to update CO-CIN paper to reflect SAGE comments.

Four Nations' Autumn Interventions

17. SAGE has previously endorsed the paper 'Four Nations' Autumn Interventions' and presented conclusions at SAGE 69. Since then, more data for tests in England have become available to modellers (around 8 million additional negative test results) which has allowed the analysis to be updated.
18. Conclusions from the analysis are similar except that in the previous version, the patterns in England emerged 4 days earlier than in this version and in the previous

version epidemics shrank in all English LTLA's under tier 3 restrictions whereas the updated version suggests that the epidemic increased in two LTLAs under tier 3.

19. SAGE endorsed the updated version of the paper.

ACTION: SAGE secretariat to release both versions of the 'Four Nations' Autumn Interventions' paper on gov.uk with appropriate explanation for the updated version on 27th November.

Relative risk of transmission factors and in different settings

20. Transmission can take place in any setting. It is important to recognise that the setting itself is not the cause of transmission, it is human behaviour, activities and interactions within a setting. However, some settings facilitate greater transmission due to a combination of risk factors (SAGE has previously advised on these risk factors, see SAGE 63).
21. Understanding the relative contribution of different settings requires data from multiple approaches including outbreak investigations, case control studies, surveillance studies, intervention studies, laboratory studies and modelling. Each of these approaches have their own biases and challenges.
22. Viral dynamics, contact patterns and environmental factors all contribute to transmission risk. Socio-economic factors act on all other factors and are mechanistically related to contact pattern, host-related factors and environment.
23. SARS-CoV-2 transmission is facilitated by close proximity, prolonged contact, confined environment, and high frequency of contacts. The average risk of transmission correlates with the closeness of social interactions: the average per-contact risk is lowest for community exposures, intermediate for social and extended family contacts, and highest in the household. The number of community or social network contacts can be very high such that these lower risk exposures may comprise a high proportion of the risk. Whilst an individual sector or setting may represent a relatively low risk or account for a relatively small amount of transmission on its own, these risks combine to create greater risks at the community or population level.

ACTION: PHE to bring back an updated paper looking at specific settings and occupations.

ACTION: BEIS CSA to share paper on '*Factors contributing to risk of SARS-CoV2 transmission in various settings*' with appropriate policy teams within BEIS.

Transmission in households

24. Households are one of the main settings for transmission. Reducing the risk of transmission in households is therefore important for limiting spread of SARS-CoV-2, as is identifying where the first person in a household is infected and thus the routes by which infection gets into the household.
25. SAGE endorsed the EMG/SPI-B paper on reducing transmission within households (subject to minor amendments) – including the household plan template which should be published alongside the main paper – as a useful practical guide. SAGE agreed that this should be considered together with other SAGE advice on celebrations and observances.
26. Isolation under all circumstances where infection is suspected or confirmed remains of particular importance. Avoiding social contacts for a period greater than the typical SARS-CoV-2 incubation period (which is around 5 days) before meeting older or

vulnerable people at Christmas will reduce the risk to them. A longer period (e.g. a week or more) would reduce the risk further. This point should be considered in relation to families and preparation for Christmas. This is also relevant for other celebrations and observances and beyond the Christmas period.

27. SAGE endorsed the Ethnicity Sub-Group paper on household transmission among minority ethnic groups, subject to amendments to the summary, clarification of terms and other points raised during discussion.
28. The data presented suggest an increased COVID-19 risk for households with more than two occupants. SAGE noted that this might be related in part to the presence of children in the household, with implications for the types of messaging required on reducing transmission in households. The data also indicated risk for multigenerational households.
29. It is difficult to establish clear explanations for the observed data summarised in the paper. SAGE noted the lack of evidence around the significance of size of infecting dose on clinical outcomes.
30. Where there is an infection in a household, the risk can be reduced by removing people from that household. Removing contacts from a household may be more effective than removing the first symptomatic person but this comes with many practical difficulties. By the time one person is symptomatic in a household, others may have become infected.
31. SAGE noted the importance of ensuring that communications are tailored to different ethnic groups, including around terms such as "bubbling", which has no obvious equivalent in some languages.

ACTION: SAGE secretariat to work with CO to release paper on reducing transmission in households including the household plan on 27th November; **CO** and **PHE** to consider how the household plan should be communicated.

ACTION: CO to look at policy options (e.g. in relation to timings of school breaks) to enable families to avoid contacts in preparation for seeing older or vulnerable relatives over Christmas.

ACTION: SAGE Secretariat and **Ethnicity Sub-Group** to finalise paper on household transmission among minority ethnic groups; Secretariat to consider teach-in for departments on contents of paper with Emran Mian. MHCLG to liaise with the team over the recommendations on housing.

Mass testing

32. SAGE has previously advised that a reduction in prevalence of 15-20% might be a realistic expectation for a single round of highly effective untargeted mass testing (see SAGE 53 and 56). Use of Lateral Flow Devices (LFDs) to test a large number of people in order to identify potentially infectious people could reduce transmission if it identifies people who wouldn't otherwise have been identified and those people then go on to isolate themselves. Uptake of testing and adherence to isolation are two of the critical factors in effectiveness (as well as sensitivity and specificity of tests).
33. Some groups contribute more to the spread of the epidemic than others, due to both high prevalence within the group and high onward transmission. Targeting groups and institutions where prevalence is likely to be higher will have a greater impact on transmission. If, however, these groups are less likely to be tested or less likely to isolate than others (or both), mass testing will have less of an effect. Targeted testing is recommended.

34. Repeated rounds of testing could have more impact than a single round. The benefit of later rounds is smaller than for the first round, particularly if the same people are more likely to come forward for testing in each round. This applies regardless of whether those people are in a high or low prevalence group. Experience from other infectious diseases shows that it is not uncommon for those at highest risk to be least likely to present for single or repeated testing rounds.
35. Emerging evidence from Liverpool is that the lateral flow tests being used are not as sensitive as had been expected from the test validation, but it is still likely that they will pick up the most infectious individuals with the highest viral load. While LFDs may pick up a smaller proportion of cases than PCR testing, the people who they do identify are more likely to be in the most infectious part of the infection cycle (whereas PCR testing will identify some people who are not yet very infectious or who are no longer very infectious). The value of pilots is clear and it is important that, as testing is rolled out, further assessment and evaluation continues. Parallel LFD and PCR testing is important in gathering more data on test effectiveness.
36. LFDs may also be considered for use cases other than population case detection. If used appropriately, lateral flow testing may reduce the risk associated with certain activities but will not eliminate it. It should not be seen as a way on its own of enabling high-risk activities to resume but could reduce the risk of open activities.
37. Test technologies need to be matched carefully with use cases. Behavioural impacts of receiving a negative test result need to be considered in all use cases, as these may be important for the overall impact of testing.
38. SAGE endorsed two important uses for widespread testing – (i) repeated and frequent targeted testing of higher risk or prevalence groups and institutions (ii) to reduce risk when activities are already occurring (e.g. to reduce the number of infectious people entering an indoor environment). SAGE has previously commented on the short duration for which a negative test provides some reassurance.

Role of children & schools in transmission

39. Work is underway to better understand a number of issues related to schools. This includes evidence on the impact of half terms and lockdowns; evidence on differing practices within schools; and factors associated with school outbreaks.

ACTION: Task & finish group on children & schools to provide an update to SAGE, including any new evidence around the risks of working in an educational setting.

List of Actions

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Task & finish group on children & schools to provide an update to SAGE, including any new evidence around the risks of working in an educational setting.

Attendees:

Scientific Experts (40): Patrick Vallance (GCSA), Chris Whitty (CMO), Jenny Harries (dCMO), Jonathan Van-Tam (dCMO), Ian Diamond (ONS), Susan Hopkins (PHE/NHST&T), Ian Young (Health NI CSA), John Edmunds (LSHTM), Calum Semple (Liverpool), Wendy Barclay (Imperial), Andrew Morris (HDR UK), Alan Penn (MHCLG CSA), Rob Orford (Wales Health CSA), Mark Wilcox (Leeds), Lucy Yardley (Bristol/Southampton), Charlotte Watts (FCDO CSA), Maria Zambon (PHE), Yvonne Doyle (PHE), Peter Horby (Oxford), Angela McLean (MoD CSA), Nicola Steedman (dCMO Scotland), Steve Powis (NHS England), Michael Parker (Oxford), Ian Boyd (St Andrews), Rohini Mathur (LSHTM), Julia Gog (Cambridge), Jeremy Farrar (Wellcome Trust), Brooke Rogers (KCL), Mark Walport (UKRI), Kamlesh Khunti (Leicester), Andrew Hayward (UCL), Andrew Curran (HSE CSA), Harry Rutter (Bath), Matt Keeling (Warwick), Cath Noakes (Leeds), Muge Cevik (St Andrews), Isabel Oliver (PHE), John Aston (HO CSA), Paul Monks (BEIS CSA), Laura Bear (LSE)

Observers and government officials (14): Rupert Shute (HO dCSA), Tom Rodden (DCMS CSA), Phil Blythe (DfT CSA), [REDACTED], Julian Fletcher (CO) [REDACTED], [REDACTED] James Benford (HMT), [REDACTED] Ben Warner (No.10), Elizabeth Morrison (Scotland), [REDACTED] Richard Roberts (Wales), [REDACTED] Osama Rahman (DfE CSA)

Secretariat (all GO-Science) (21): [REDACTED]
[REDACTED] Simon Whitfield, Stuart Wainwright, [REDACTED]
[REDACTED]

Total: 75