Sixtieth SAGE meeting on Covid-19, 1st October 2020
Held via Zoom

Summary

1. Some data streams indicate potential slowing in the growth rate of the epidemic, but it remains highly likely that infection incidence is growing overall. The latest estimate of R for the UK is 1.3 to 1.6.
2. Unless current NPIs reduce R back below 1 soon, it is likely that infection incidence and hospital admissions will exceed scenario planning levels in the next two weeks.
3. Ventilation is an important mitigation measure against far-field (>2m) aerosol transmission. Priority should be given to improving ventilation of spaces which are most likely to result in a high transmission rate, including multi-occupant spaces with very low ventilation rates. Ventilation should be considered alongside other control measures.
4. Far-field aerosol transmission depends on the interaction of multiple factors including the viral emission rate, the ventilation rate, the number of occupants, the duration of exposure, and temperature and humidity.
5. Elevated CO_2 levels in indoor air can be a useful indicator of poor ventilation, however CO_2 is not a good indicator for monitoring transmission risk in low occupancy or large volume spaces.
6. There is no evidence that the current viral variants are more or less virulent than previously circulating strains, however this may change in the next phase of the epidemic as the use of vaccines or treatments may exert selective pressures on the virus.

Situation update

7. Incidence across the UK continues to increase, and data show clear increases in hospital and ICU admissions in some regions, including in London. There are some early indications that growth in new infections may be slowing, though more data are needed to accurately assess any recent changes to the growth rate, and it remains highly likely that infection incidence is growing overall.
8. The highest case rates continue to be seen in 20-29 year olds, however data also shows increases in other age groups, particularly 15-18 year olds. There is also growth in older age groups.
9. The latest estimate of R for the UK is 1.3 to 1.6, while the daily growth rate estimate for new infections is +5% to +9%. The latest estimate of R for England is 1.2 to 1.6, while the daily growth rate estimate is +4% to +8%.
10. The growth rate estimates equate to a doubling time for new infections of 8 to 14 days. However there is significant heterogeneity across regions and the potential for faster doubling times in certain areas.
11. As previously noted, these estimates do not fully reflect recent changes in transmission from the last two to three weeks. Operational issues in the testing systems have also increased the level of uncertainty in estimates.
12. Surveillance studies such as REACT-1 and the ONS infection survey are likely to be more reliable indicators of changes in incidence and prevalence than testing system data.
13. Interim results from the latest REACT-1 survey show potential slowing in the growth of the epidemic, following increases in August and early September. However, there is considerable uncertainty in the estimates due to the short sampling timescale. However REACT-1 data still show an R number greater than 1 suggesting infections continue to increase across the country.

14. While there are variations in data from different sources on transmission in London, which may be related to accessibility and uptake of testing, data from the REACT-1 survey and ONS infection survey show increases in incidence in London. ICU admissions in London have also increased.
15. Although more data are needed to accurately assess any recent changes to the growth rate, it is highly likely that infection incidence is growing overall. SAGE reiterated the importance of continuing to monitor the epidemic closely and taking necessary action.
16. SAGE endorsed the SPI-M medium-term projections – noting sensitivities in the modelling. When modelling exponential growth, small variations in assumptions can lead to significant variations in projections. These projections should be read in conjunction with information on assumptions and sensitivities. The medium-term projections should be treated as a guide to potential outcomes based on current trends and not interpreted as forecasts. These models do not reflect the impact of recently announced NPIs or other recent changes such as the return of universities.
17. Assuming no further policy or behavioural changes occur, near-term projections suggest it is likely that infection incidence and hospital admissions will exceed the Reasonable Worst Case Scenario (RWCS) planning levels over the next two weeks.
18. If recently announced measures have brought R below 1, exceedance of the RWCS planning levels could be modest and short-lived, but if R remains above 1 then the epidemic will further diverge from the planning scenario.
19. As previously, further measures on a national and local scale will be needed to bring R below 1 in the event that current measures do not do so. The earlier additional measures are introduced the more effective they will be. Longer-term sustained measures will also be essential.
20. CoMix data up to September 21st show contacts with non-household members have continued to increase and are now around half the level they were prior to the epidemic. Data suggests higher rates of contact in younger females than younger males, and higher rates of contacts in older males than older females. These contact data can provide useful leading indicators of transmission.
21. SAGE considered a study of excess all-cause mortality from twenty-four European countries over the period 2015-2020. For most previous years, there is no clear association between higher peak excess mortality in past years and the peak excess mortality during COVID-19. There is a positive correlation between peak excess mortality in the first half of 2018 and the first half of 2020 (moderate confidence). Some factors related to health and social care spending and provision increased the likelihood of high excess mortality.
22. SAGE has previously advised testing of hospital patients prior to discharge. The Senior Clinicians Group agrees that universal testing of discharged hospitalised patients is beneficial. However, current constraints on testing means that prioritisation of capacity is required for other uses e.g. for health and social care staff.

ACTION: NHS England to note medium-term projections in relation to the RWCS.

ACTION: SAGE secretariat to share CoMix data with Cabinet Office, and highlight its potential value as a leading indicator of transmission.

ACTION: Graham Medley to draft statement on SPI-M view of the relation between mortality in previous flu seasons and in the COVID-19 epidemic, and possible factors explaining any correlation (including strength of evidence for these explanations), by 2nd October.

Ventilation

23. SAGE endorsed the EMG paper on ventilation – subject to amendments and review with SPI-B members.
24. Ventilation is an important mitigation measure against far-field (>2m) aerosol transmission. Ventilation is not likely to have significant impacts on close range transmission by droplets and aerosols (within 1-2m) or transmission via contact with surfaces (high confidence).
25. There is currently no evidence for significant far-field aerosol transmission in well ventilated spaces (medium confidence).
26. Far-field aerosol transmission depends on the interaction of multiple factors including the viral emission rate, the ventilation rate, the number of occupants, the duration of exposure, and temperature and humidity.
27. Priority should be given to improving ventilation of spaces which are most likely to result in a high transmission rate, such as multi-occupant spaces with very low ventilation rates (high confidence).
28. SAGE has previously advised on the risks of aerosol transmission where there are activities that increase aerosol production e.g. singing, loud speech, aerobic activity, and in healthcare and dental settings. In some spaces even enhanced ventilation may not fully mitigate this risk.
29. Elevated CO_2 levels in indoor air can be a useful indicator of poor ventilation, particularly in multi-occupant spaces.
30. In low occupancy or large volume spaces there is much greater uncertainty in CO_2 measurements, therefore a low level of CO_2 should not be used as an indicator or to monitor that ventilation is sufficient to mitigate transmission risks (medium confidence).
31. Measures to improve ventilation should not be taken in isolation and should be part of an approach to risk reduction that considers all transmission routes and prioritises risk control.
32. To mitigate aerosol transmission, ventilation should be considered alongside other control measures such as restricting or reducing the duration of aerosol-generating activities. Enhanced use of face coverings should be considered alongside ventilation for reducing far-field aerosol transmission risks.
33. Assessing ventilation in many environments requires engineering expertise, and any mitigation measure should consider the individual nature of buildings and users, ventilation type, length of exposure and activity.
34. Increasing ventilation rates may have other negative consequences including increased energy use and reduced thermal comfort.
35. Any changes to ventilation must consider other negative consequences including financial, energy use, noise, security and health and wellbeing impacts from thermal discomfort and exposure to pollutants.
36. The effectiveness of ventilation in many environments is strongly influenced by user behaviour. Clear messaging and guidelines will be needed to improve understanding on the reasons why good ventilation is important and how to effectively operate ventilation systems or achieve good natural ventilation.

ACTION: EMG to revise the paper on ventilation to emphasise actions that should be considered, include confidence statements in summary, clarify section on CO_2 monitoring, and include a statement on humidity (by 7th October). **SAGE secretariat** to circulate revised paper to PHE, HSE, BEIS, DCMS, DfE, CO and DAs.

ACTION: PHE to decide on appropriate public communications based on the ventilation paper; **HSE** to use paper to inform development of guidance on ventilation.

Viral Phenotypes and Human Genomics

37. Sequence data from COG-UK has identified numerous changes in the SARS-CoV-2 genome. However, there is no evidence that the current viral variants are more or less virulent than previously circulating strains (high confidence). There is evidence of a mutation (D614G) that may be associated with increased transmission. SAGE agreed that there is a need for continued surveillance and for the UK to have the capability to assess phenotypic consequences of SARS-CoV-2 mutations.
38. Although limited phenotypic diversity in viral strains has emerged to date, this may change in the next phase of the epidemic as the use of vaccines and treatments may exert new selective pressures (moderate confidence). There may also be changes when people become reinfected, which is consistent with other viruses.
39. SAGE considered findings from human genomic studies including GenOMICC. Targets for potential therapies are being identified, including related to interferon and other inflammatory pathways. No findings of clinical or diagnostic use have yet been identified.

ACTION: UKRI to consider a clear pathway for enabling viral phenotyping capability in the UK, and clinical phenotyping of mild disease, including long-COVID.

List of actions

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UKRI to consider a clear pathway for enabling viral phenotyping capability in the UK, and clinical phenotyping of mild disease, including long-COVID.

Attendees

Scientific Experts (37): *Patrick Vallance (GCSA), Chris Whitty (CMO), Jenny Harries (dCMO), Jonathan Van Tam (dCMO), John Aston (CSA HO), Andrew Curran (CSA HSE), Ian Diamond (ONS), Susan Hopkins (JBC), Ian Young (CSA Health NI), Graham Medley (LSHTM), John Edmunds (LSHTM), Catherine Noakes (Leeds), Peter Horby (Oxford), Jeremy Farrar (Wellcome), James Rubin (KCL), Calum Semple (Liverpool), Ian Boyd (St. Andrews), Wendy Barclay (Imperial), Robin Grimes (MoD Nuclear), Jim McMenamin (Health Protection Scotland), Andrew Morris (Edinburgh), Sharon Peacock (PHE), Sheila Rowan (CSA Scotland), Maria Zambon (PHE), Charlotte Watts (CSA DfID), Michael Parker (Oxford), Sharon Peacock (PHE), Mike Prentice (NHSE), Rob Orford (Health, CSA Wales), Mark Walport (UKRI), Mark Wilcox (Leeds), Lucy Yardley (Bristol and Southampton), Kenneth Baillie (Genomics Scotland), Mark Caulfield (Genomics England), Steve Powis (NHSE), Julia Gog (Cambridge), Julian Hiscox (Liverpool).*

Observers (15): [redacted] *Ben Warner (No. 10),* [redacted] *Julian Fletcher (CO),* [redacted] *Vanessa MacDougall (HMT),* [redacted] *Imran Shafi (No. 10),* [redacted] *Paul Monks (CSA BEIS),* [redacted] *Phil Blythe (CSA DfT),* [redacted] *Tom Rodden (CSA DCMS), Thomas Waite (JBC), David Lamberti (DHSC).*

Secretariat (all GO-Science) (14): [redacted] *Simon Whitfield, Stuart Wainwright,* [redacted]

Total: 66