Eighty-sixth SAGE meeting on COVID-19, 08 April 2021

Held via Video Teleconference

Summary

1. R estimates for England, Scotland, and Northern Ireland are between 0.8 and 1.0. For Wales, R is between 0.6 and 0.9. R estimates in England have increased slightly over the last few weeks. The upper limit of the range for six of the seven regions in England is 1.0, reflecting a flattening in transmission (i.e., the decline in rates of new infections seems to have flattened). As prevalence falls, individual clusters and outbreaks have a greater effect on regional estimates. Estimates of R and daily growth rate become less useful as a guide to the state of the epidemic when there is more variability in the population.
2. Data from before the pandemic shows that for adults, the majority of contacts are associated with work (for children, the majority are associated with school). The trajectory of the epidemic over the coming months is therefore likely to depend to a large extent on the scale of increase in workplace contacts (high confidence).
3. While wild-type SARS-CoV-2 appears unable to infect rats and mice, laboratory studies suggest that the N501Y spike protein mutation (found in several variants of concern) increases binding to rat and mouse ACE2 leading to viral replication. SARS-CoV-2 infection in wild rodents has not however been detected. While rodents are a possible animal reservoir, the likelihood currently of a variant of concern (VOC) emerging as a result of adaptation in rodents is low.
4. Wastewater monitoring can help to track the presence of SARS-CoV-2 (including new VOCs in the population, alongside clinical testing. It is particularly useful to detect outbreaks when prevalence is low (including in areas where community engagement with testing is low) and also to detect presence and geographical spread of new variants. It is less effective for precise quantification of levels of SARS-CoV-2 (or particular variants) in a population.
5. The contribution of a setting to population infection rates will depend on the likelihood of transmission occurring within that environment, the frequency with which people visit that setting. The likelihood of transmission increases with the duration spent in the setting. Bringing together several risk factors increases the likelihood of transmission happening in a setting. As more settings reopen and activities resume, there will be network multiplier effects which increase transmission further, so settings and activities cannot be considered in isolation.
6. The fraction of cases in a population that can be attributed to any individual sector is relatively low, as transmission happens in many settings and during many activities (high confidence). It is difficult to assess the past transmission associated with the hospitality, leisure and retail sectors, as they have been operating under different levels of restrictions for the past year. This also makes it difficult to estimate the potential risk associated with reopening. Overall, data suggest that the hospitality sector is associated with greater risk of transmission than leisure and retail sectors.
7. Staff attending the workplace whilst unwell (which may be more likely if not provided with paid sick leave or financial compensation) increases the risk of transmission in the environment, as well as the risk for customers and other staff members (high confidence). This a major modifiable risk.

8. SAGE supported the use of open science principles for the events research programme, including pre-registration and publication of protocols and analysis plans.

Situation Update

9. R estimates for England, Scotland, and Northern Ireland are between 0.8 and 1.0. For Wales, R is between 0.6 and 0.9. It is likely that the majority of the impact of the reopening of schools is reflected in these estimates, but they will not yet reflect the impact of recent changes, such as those made in England from the 29th March.
10. R estimates in England have increased slightly over the last few weeks. The upper limit of the range for six of the seven regions in England is 1.0, reflecting a flattening in transmission across the country (i.e., the decline in rates of new infections seems to have flattened). There continues to be local variation which needs to be monitored.
11. As prevalence falls, individual clusters and outbreaks have a greater effect on regional estimates. Estimates of R and daily growth rate become less useful as a guide to the state of the epidemic when there is more variability in the population.
12. SPI-M contributors have produced updated 'ready reckoners' which illustrate the relationship between R, the number of contacts made outside home and school, vaccination rollout, and school opening. These show that vaccination of older age groups (though being the most effective way of preventing illness and death) has a relatively small impact on population-wide transmission, as on average older people have fewer contacts. As younger age groups are vaccinated, a greater impact on transmission is expected. These ready reckoners will be useful when considering the impact of relaxation of social distancing.
13. CoMix data show that the mean number of self-reported contacts increased during March 2021 for both adults and children, as was seen at the end of previous lockdowns. The CoMix study has been running for about a year, and its data show that the highest level of contacts for adults occurred in August 2020 before declining again in the autumn. The increase to the peak in August 2020 was a combination of increased social and work contacts (although some of the effect may be explained by a change in the panel used).
14. Data from before the pandemic shows that for adults, the majority of contacts are associated with work (for children, the majority are associated with school). The trajectory of the epidemic over the coming months is therefore likely to depend, to a large extent, on the scale of increase in workplace contacts. Even in summer 2020 when workplace contacts increased, they were still significantly lower than prior to the pandemic.
15. PHE continues to investigate clusters of infections caused by variants of concern (VOC).
16. CO-CIN data are showing that the length of stay in hospital of COVID-19 patients may have reduced slightly. The reasons for this are not clear but may be related to vaccination and/or differences in the severity of cases.
17. NHSTT has access to the data needed to assess the proportion of patients who have been identified through the test, trace and isolate system prior to hospitalisation, which SAGE reiterates is a useful metric in assessing the performance of the system.

ACTION: NHS England to review CO-CIN analysis on changes in length of stay and to compare with its own analyses, considering also potential changes in demographics of patients or differences in disease course.

Animal reservoirs

18. While wild-type SARS-CoV-2 appears unable to infect rats and mice, laboratory studies suggest that the N501Y spike protein mutation (found in several VOCs) increases binding to rat and mouse ACE2 leading to viral replication. SARS-CoV-2 infection in wild rodents has not however been detected.
19. The risk of exposure of wild rodents would depend on the overall level of virus circulating in the human population (the risk declines with fewer human infections). Although the risk of viable virus persisting in the environment (e.g. wastewater or household waste) is very low, the large population size of wild rodents suggests that the possibility of a rodent receiving an infectious dose of virus from such a source is high (low confidence). Such an infection could result in sustained transmission among rodents.
20. If sustained transmission in rodents were to occur, the risk of exposure to infection from a rodent would be very low for the general public, but medium for those with high occupational exposure (low confidence).
21. While rodents are a possible animal reservoir, the likelihood currently of a VOC (to humans) emerging as a result of adaptation in rodents is low, and certainly lower than in the human population, as it is expected that adaptation to rodent hosts would reduce the virus' ability to transmit to or between humans (low confidence).

Wastewater monitoring and regional divergence in variants

22. Current wastewater monitoring of SARS-CoV-2 covers up to 70% of the population of England. Samples are collected and tested four times a week, with data used to identify outbreaks and inform local responses.
23. Wastewater monitoring can help to track the presence of SARS-CoV-2 (including new VOCs in the population, alongside clinical testing). It is particularly useful to detect outbreaks when prevalence is low (including in areas where community engagement with testing is low) and also to detect presence and geographical spread of new variants. It is less effective for precise quantification of levels of SARS-CoV-2 (or particular variants) in a population.
24. A pilot using genomic sequencing during wastewater testing in Bristol has been shown to be effective at identifying VOCs. Increases in VOCs identified in samples reflected increases in cases confirmed by clinical testing in the same area over the same period.
25. Attempts to assess vaccine efficacy in England through wastewater monitoring since the start of the vaccine rollout have been confounded by three factors: the introduction of a third lockdown, a change in the laboratory testing methods used during this period, and the emergence of new variants of SARS-CoV-2 (including B.1.1.7) that could result in different viral loads in waste. Therefore, there is not currently sufficient evidence available through wastewater monitoring to assess the impact of vaccination on transmission.
26. Wastewater monitoring programmes have the potential to expand to test for other pathogens of concern in the future to protect public health.

Transmission in leisure, hospitality, and retail

27. Transmission is strongly associated with proximity, duration and frequency of contact and community prevalence. The highest risks of transmission are associated with poorly ventilated and crowded indoor settings (high confidence). There is increasing evidence for airborne transmission over longer distances in some situations (e.g. transmission between rooms in quarantine hotels has been recorded). This type of transmission is often hard to identify, making its contribution to overall transmission difficult to quantify.
28. The contribution of a setting to population infection rates will depend on both the likelihood of transmission occurring within that environment, and the frequency with which people visit that setting. The likelihood of transmission increases with the duration spent in the setting.
29. Settings with more risk factors which are visited frequently by many people, are likely to have a much bigger impact on population level transmission than those visited less frequently, or by fewer people (high confidence). The fraction of cases in a population that can be attributed to any individual sector or activity is relatively low, as transmission happens in many settings and during many activities (high confidence).
30. As more settings reopen and activities resume, there will be network multiplier effects which increase transmission further, so settings and activities cannot be considered in isolation.
31. It is difficult to assess the past transmission associated with the hospitality, leisure and retail sectors as they have been operating under different levels of restrictions for the past year. This also makes it difficult to estimate the potential risk associated with reopening.
32. It is also difficult to ascertain the individual contribution of these sectors to the overall transmission rates as they are closely linked to other activities and occupations, such as those associated with warehouses, delivery work, food production, and transport. Once hospitality and retail services are open, it leads to greater mixing and mobility across the population (medium confidence).
33. Though there are limitations in the evidence base (both due to the difficulty in gathering evidence related to settings which are closed, but also due to the challenges associated with some types of study such as case control studies), the sources of evidence available have broadly consistent findings. These sources include international and UK evidence, such as mobility data, case-control studies, secondary attack rates, outbreak investigations and cluster concordance.
34. Studies which rely on the reporting of contacts (e.g., contact tracing data) may be less likely to identify transmission from asymptomatic people or transmission through long-range aerosols, which may lead to some underreporting of risk.
35. Overall, data suggest that the hospitality sector is associated with greater risk of transmission than the leisure and retail sectors.
36. Staff working in these sectors are shown to be at significantly higher risk of infection than customers, consistently demonstrated in all studies. Close contact service staff, in particular those working in restaurants, bars, and pubs, had the highest risk observed (high confidence).
37. There are several factors which may contribute to this risk, including frequent and multiple contacts at work, long working hours, working in settings where adherence to mask use or social distancing may be challenging, sharing transport or using public transport, or being more likely to live in large or multiple occupancy households (high confidence).
38. Staff attending the workplace while unwell (which may be more likely if not provided with paid sick leave or financial compensation) increases the risk of transmission in

the environment, which increases risk for customers and other staff members (high confidence). This a major modifiable risk.

39. As settings reopen, prevention measures will be important, e.g., limiting building occupancy, improving ventilation, prioritising outdoor seating, use of face coverings, physical distancing, adherence to quarantine, and encouraging vaccination.

ACTION: EMG Transmission subgroup to update the paper 'Transmission in leisure, hospitality, and retail' and share with the C19 taskforce social distancing review team.

Science framework for opening group events

40. SAGE noted the science framework for opening up group events prepared for DCMS. This approach could be a useful model for others looking to generate high-quality evidence on transmission risk in other sectors.
41. SAGE supported the use of open science principles for the programme, including pre-registration and publication of protocols and analysis plans.
42. It will be important for pilots to work closely with Directors of Public Health to understand the local context and learn from past experiences.

AOB

43. SAGE paid tribute to the outstanding contribution of Sir Paul Cosford, who died on 5th April, to the COVID-19 response and to public health over many years, including valuable input to SAGE during multiple emergencies.

List of actions

NHS England to review CO-CIN analysis on changes in length of stay and to compare with its own analyses, considering also potential changes in demographics of patients or differences in disease course.

EMG Transmission subgroup to update the paper 'Transmission in leisure, hospitality, and retail' and share with the C19 taskforce social distancing review team.

Attendees

Scientific experts (38): *Patrick Vallance (GCSA), Chris Whitty (CMO), Angela McLean (MoD CSA), Brooke Rogers (KCL), Calum Semple (Liverpool), Catherine Noakes (Leeds), Charlotte Deane (UKRI), Charlotte Watts (FCDO CSA), Fliss Bennee (Welsh Government), Gideon Henderson (Defra CSA), Graham Medley (LSHTM), Harry Rutter (Bath), Helen Roberts (Defra), Ian Boyd (St Andrews), Ian Diamond (ONS), Ian Young (NI CSA), Isabel Oliver (PHE), James Wood (Cambridge), Jeanelle de Gruchy (ADPH), John Edmunds (LSHTM), Josh Bunce (Defra/JBC), Kamlesh Khunti (Leicester), Linda Partridge (Royal Society), Maria Zambon (PHE), Mark Walport, Mark Wilcox (NHS), Michael Parker (Oxford), Nicola Steedman (dCMO Scotland), Peter Horby (Oxford), Shannon Nolan (Defra/JBC), Sharon Peacock (PHE), Sheila Rowan (CSA Scotland), Stephen Powis (NHS England),*

Theresa Marteau (Cambridge), Wei Shen Lim (Nottingham), Wendy Barclay (Imperial), and Yvonne Doyle (PHE).

Observers and government officials (31): *Alan Penn (MHCLG CSA), Andrew Curran (HSE CSA), Andrew Morris (HDRUK),* [redacted] *Ben Warner (No.10), Christopher Williams (PHW), Christianne Glossop (CVO Wales), Christine Middlemiss (CVO England),* [redacted] *Elizabeth Sadler (Scottish Government),* [redacted] *Giri Shankar (PHW), James Benford (HMT), Jennifer Rubin (HO CSA), Jim McMenamin (Health Protection Scotland), Julian Fletcher (CO), Liz Lalley (Welsh Government),* [redacted] *Robert Huey (CVO NI), Rob Harrison (CO), Robin Grimes (MoD),* [redacted] *Rupert Shute (Home Office), Sheila Voas (CVO Scotland), Siobhan Campbell (DfT), Soheila Amin-Hanjani (BEIS),* [redacted] *and Tom Rodden (DCMS CSA).*

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

Total: 83