**Seventy-first SAGE meeting on Covid-19, 3rd December 2020**
**Held via Video Teleconference**

## Summary


1. Estimates of R and growth rates have fallen slightly in recent weeks. Latest estimates are based on data available up to 1st December and now reflect most of the impact of the national restrictions introduced in England on 5th November. The latest estimates of R for the UK, England and Scotland are all 0.8 to 1.0. The daily growth rate for new infections in the UK is -3% to -1% and -3% to 0% for England. Estimates of R for Wales and Northern Ireland are 0.8 to 1.1 and 0.8 to 0.9 respectively.
2. The epidemic is shrinking in most NHS England regions including the North West of England, Midlands, and North East and Yorkshire where the R estimates are below 1. London and the South East have upper bound R estimates above 1 (both at 1.1). The delay between recent trends being reflected in the data means R estimates may continue to decline in the future.
3. SPI-M estimates that there are between 33,000 and 62,000 new infections per day in England.
4. Considering the impact of the festive period on transmission of SARS-CoV-2, modelling suggests there could be changes in the age distribution of infections over the festive period, specifically a slight shift towards a higher proportion of cases in older and more vulnerable age groups, which could lead to an increase in hospitalisations.
5. It is likely that mixing between households over the holiday period for one or two days would be less risky than multiple households spending the entire time together (high confidence). Exclusivity of bubbles is also an important factor in limiting the additional risk (high confidence).
6. Some modelling suggests there may be benefits if everyone were to take a single lateral flow test before a multi-day gathering inside a home, though the impact is sensitive to the assumptions made including around test sensitivity and adherence to isolation. As previously noted, lateral flow testing should not be seen as a way on its own of enabling high-risk activities to take place but could reduce the risk of activities being undertaken.


## Situation Update

7. The R and growth rate estimates rely on lagged data and mask wide regional variation in the number of new infections. Latest estimates are based on data available up to 1st December and now reflect most of the impact of the national restrictions introduced in England on 5th November. It is likely that the reduction in hospital admissions will soon be followed by a reduction in daily deaths.
8. Estimates of R and growth rates have fallen slightly in recent weeks. The latest estimates of R for the UK, England and Scotland are all 0.8 to 1.0. The daily growth rate for new infections in the UK is -3% to -1% and -3% to 0% for England. Estimates of R for Wales and Northern Ireland are 0.8 to 1.1 and 0.8 to 0.9 respectively. SPI-M is not confident that R is below 1 in Wales. While R has decreased from the levels estimated in previous weeks, SPI-M estimates may continue to decline further next week due to this lag, even if the trends change during that time.
9. The epidemic is shrinking in most NHS England regions. For the North West of England, Midlands, and North East and Yorkshire, the R estimates are below 1. London and the South East have upper bound R estimates above 1 (both at 1.1). Although SPI-M's estimates of R for these regions span 1, the delay between recent trends and reflection in the data means R estimates may continue to decline in the future.

10. Estimates from SPI-M using data up to 2nd December suggest that there are between 33,000 and 62,000 new infections per day in England, which is marginally lower than last week's estimate.
11. The ONS infection survey estimates that from 22nd to 28th November an average of 521,300 people had COVID-19 in the community in England, with 25,700 new infections per day in England. The data do not include people in care homes, hospitals, or university halls of residence which SPI-M estimates include. ONS data is more likely to reflect changes in prevalence more rapidly than the clinical data SPI-M models rely on.
12. SPI-M continues to consider the impact of the festive period on transmission of SARS-CoV-2. Preliminary analysis suggests that if additional mixing is restricted to three households meeting per day and to the five day window of relaxations, both the total number of days spent mixing and the exclusivity of the bubbles will have a significant impact on subsequent prevalence (high confidence). It is likely that mixing between households over the holiday period for one or two days would be less risky than multiple households spending the entire time together (high confidence).
13. Modelling also suggests there could be changes in the age distribution of infections over the festive period, specifically a slight shift towards a higher proportion of cases in older and more vulnerable age groups. The more days over which additional mixing happens, the greater the increase in incidence in the over 65's.
14. The outcome of relaxed measures over the festive period remains highly uncertain. With schools and many workplaces closed, transmission in these settings and their associated age groups is likely to fall but may be replaced by riskier interactions in other social settings with older, more vulnerable individuals. Transmission to elderly and more vulnerable people might increase the incidence of disease more than the incidence of infection. Potential changes in behaviour, including in seeking tests, and possible disruption in data cycles, mean that it could take several weeks to fully understand changes over this period.
15. SPI-M has continued investigating the impact of mass testing on secondary infections. Some modelling suggests there may be benefits if everyone were to take a single lateral flow test (LFT) before a multi-day gathering inside a home, though the impact is sensitive to the assumptions made including around test sensitivity and adherence to isolation. As previously noted, lateral flow testing should not be seen as a way on its own of enabling high-risk activities to take place but could reduce the risk of activities that are due to occur anyway.
16. Considering the introduction of mass testing with lateral flow devices and the introduction of immunisation, SAGE stressed the importance of ensuring consistent recording of data and ensuring this data is available to maintain an understanding of the epidemic.
17. SAGE considered medium-term projections covering a 3-week period rather than the usual 6-week period. This is due to uncertainty around the impact of the festive season on transmission. As previously noted, these projections are not forecasts or predictions. They represent a scenario in which the trajectory of the epidemic continues to follow the trends that were seen in the data up to the 30th November.
18. As previously noted, environmental monitoring for SARS-CoV-2 has been used in various settings to provide epidemiological evidence on the extent of outbreaks, and to provide evidence on the risk posed by contaminated surfaces, water and air. SAGE noted limitations of some analytical approaches to quantify virus in environmental samples including the use of molecular methods (e.g. qPCR). Approaches and limitations to monitoring SARS-CoV-2 in the environment were outlined in the papers.
19. SAGE reviewed the paper '*Factors contributing to risk of SARS-CoV-2 transmission in various settings'* and suggested some amendments to statements on the risk of transmission in specific settings.

20. While data from contact tracing can be used to determine epidemiological links between cases, it is not designed to confirm where transmission occurred, and reporting is subject to biases. Analysis of over 1.2 million cases identified through Test and Trace and their named contacts showed that only 19% of cases had previously been identified as close contacts of other cases, including 15% who were household contacts. This is likely to be due to underreporting of contacts as well as some transmission between people who are not known to each other (high confidence). Looking at prevalence by occupation may give a better indication as to the settings outside the household where transmission happens, as this is less likely to be underreported. SAGE will consider occupational risks at a future meeting.

**ACTION: PHE** to review the drafting of statements regarding the risks of transmission in the paper '*Factors contributing to risk of SARS-CoV2 transmission in various settings'*.

**ACTION: SAGE secretariat** to share advice with Cabinet Office on potential benefits of lateral flow testing ahead of household gatherings; Cabinet Office to confirm if further advice is required.

**ACTION: Jonathan Van Tam** to liaise with SPI-M on specifics of data requirements from vaccination and testing.

**Testing and quarantine strategies for international arrivals**

21. SAGE considered a paper on the number of SARS CoV-2 infections potentially resulting from returning travellers under different quarantine and testing strategies including quarantine (14 days), test to release (PCR test on day 5 and release if negative), and daily lateral flow testing with isolation if positive (for 3, 5 or 7 days).
22. Under the scenarios outlined in the paper, there are potentially higher counts of infections resulting from returning travellers for a daily lateral flow testing approach as compared to the 5-day and 14-day quarantine options. Differences in the median number of infections converge across the options over time.
23. Test sensitivity and adherence to isolation will both make a significant difference to the effectiveness of any approach. There is uncertainty around both of these parameters. The overall impact of policy decisions would also depend on the travel and household circumstances of returning travellers. The findings are also likely sensitive to the distribution of infectious ages at arrival and the timing of when cases are likely to test positive with lateral flow testing.

**ACTION: SPI-M** to summarise modelling of different strategies for quarantine of contacts or travellers, including differences in assumptions, for SAGE on 10th December.

**List of Actions**

**PHE** to review the framing of statements regarding the risks of transmission in hospitality settings in the paper '*Factors contributing to risk of SARS-CoV2 transmission in various settings'*.

**SAGE secretariat** to share advice with Cabinet Office on potential benefits of lateral flow testing ahead of household gatherings; Cabinet Office to confirm if further advice is required.

**Jonathan Van Tam** to liaise with SPI-M on specifics of data requirements from vaccination and testing

**SPI-M** to summarise different papers on modelling strategies for quarantine of contacts or travellers, including differences in assumptions, for SAGE on 10th December.

**Attendees:**

***Scientific Experts (37):*** *Patrick Vallance (GCSA), Chris Whitty (CMO), Andrew Morris (HDR UK), Angela McLean (MoD CSA), Brooke Rogers (KCL), Calum Semple (Liverpool), Cath Noakes (Leeds), Charlotte Watts (FCDO CSA), Graham Medley (LSHTM), Ian Boyd (St Andrews), Ian Diamond (ONS), James Rubin (KCL), Jenny Harries (dCMO), Jeremy Farrar (Wellcome), John Edmunds (LSHTM), Jonathan Van Tam (dCMO), Julia Gog (Cambridge), Kamlesh Khunti (Leicester), Maria Zambon (PHE), Mark Walport (UKRI), Mark Wilcox (NHS), Michael Parker (Oxford), Peter Horby (Oxford), Robin Grimes (MoD CSA), Stephen Powis (NHS England), Wendy Barclay (Imperial), Yvonne Doyle (PHE), Nicola Steedman (Scotland), Harry Rutter (Bath), Gideon Henderson (DEFRA CSA), Isabel Oliver (PHE), Elizabeth Fearon (LSHTM), Rob Orford (Wales, Health CSA), Sheila Rowan (Scotland CSA), Susan Hopkins (PHE/NHST&T), Sheila Rowan (Scotland CSA), Ian Young (NI, CSA for Health)*

***Observers and government officials (22):*** *James Bowler (CO), Paul Monks (BEIS CSA),* [redacted] *Julian Fletcher (CO),* [redacted]*, Phil Blythe (DfT CSA)* [redacted] *Carole Mundell (FCDO CSA), James Benford (HMT), John Aston (HO CSA), Rupert Shute (HO CSA), Andrew Curran (HSE CSA),* [redacted] *Anna Seale (JBC), Alan Penn (MHCLG CSA), Ben Warner (No.10),* [redacted]

***Secretariat (all GO-Science) (22):*** [redacted] *Crystal Moore,* [redacted] *Stuart Wainwright, Simon Whitfield,* [redacted]

***Total: 81***