

## Eighty-eighth SAGE meeting on COVID-19, 05 May 2021

### Held via Video Teleconference

#### Summary

1. There has been a significant recent increase in prevalence of the B.1.617.2 variant, including some community transmission. PHE is currently prioritising case finding and containment for this variant. Early indications, including from international experience, are that this variant may be more transmissible than the B.1.1.7 variant (low confidence).
2. SARS-CoV-2 is continuing to evolve antigenically (high confidence). There is a need for medium and long-term strategies for vaccination in response to this. Effective vaccine updates will require coordinated virus and immunity surveillance, linked to serology, immunology, structural biology, and viral phenotyping. The UK should build on what it has developed during the pandemic to create a sustainable hub for this.
3. Modelling shows that taking step 3 of the roadmap is alone highly unlikely to put unsustainable pressure on the NHS. It is, however, likely to lead to R being greater than 1 in England, and therefore an increase in infections. The full impact of step 3 on hospitalisations and deaths will not be seen until mid-June at the earliest.
4. It remains highly likely that there will be a further resurgence in hospitalisations and deaths at some point, however, the scale, shape, and timing remain highly uncertain.
5. The resurgence will be smaller if baseline measures and sustained changes in behaviour which reduce transmission are maintained beyond the end of the roadmap (high confidence). The speed of vaccine rollout is also a key factor in the size of the resurgence (high confidence). The two biggest risks (absent new variants) are that either high contact patterns emerge early, or there is low vaccine rollout amongst younger adults. The combination of these two would lead to a larger resurgence.
6. A variant which either substantially escapes immunity or is highly transmissible (more so than B.1.1.7) could lead to a very significant wave of infections, potentially larger than that seen in January 2021 if there were no interventions. Given the uncertainty around the properties of any such variant the modelling is based on some illustrative scenarios only. Maintaining control of transmission of any such variants will be more difficult when there are fewer measures in place. Reducing the number of variant infections should be a priority for policy.
7. There remain several sources of uncertainty in the modelling, including around behavioural responses to changes in policy (after both step 3 and step 4), the impact of any seasonal variation in transmission, the extent of waning immunity, vaccine rollout speed, and the impact of vaccination on transmission (including from asymptomatic infected people).

#### Situation Update

8. SPI-M estimates that there are between 1,000 and 5,000 new infections per day in England.
9. R is estimated to be between 0.8 and 1.0 in England, between 0.7 and 1.0 for both Scotland and Wales, and between 0.8 and 1.1 for Northern Ireland. Current estimates do not yet fully reflect recent changes, such as the return of schools after Easter holidays, but will reflect behavioural changes since the easing of restrictions in England on 12th April.

10. At a local level, estimates of R for most areas from one analysis have increased over the last fortnight, but in most cases remain below 1 (though there are local areas in all nations where the epidemic is increasing). If there is a small overall increase in transmission nationally (e.g., due to relaxation of restrictions), R would go above 1 in many more areas. In these cases, local outbreaks could coalesce and lead to regional transmission. As SAGE has advised previously, dealing with outbreaks quickly will be important.
11. Comparing CoMix timeseries data with infections and hospitalisations shows that in the past increases in contacts have been followed by increases in R, infections, and hospitalisations. In 2020 the number of contacts remained low until the start of August, despite there being many policy changes over that period. There has been a recent increase in the number of adult contacts, but this remains lower than that seen last August and is increasing more slowly. Contact survey data and mobility data will continue to be useful lead indicators.
12. There has been a significant recent increase in prevalence of the B.1.617.2 variant, including some community transmission. PHE is currently prioritising case finding and containment for this variant. Early indications, including from international experience, are that this variant may be more transmissible than the B.1.1.7 variant (low confidence). One hypothesis is that this is linked to the P681R mutation.
13. Sequencing all cases from hospital patients remains important for surveillance and understanding of the impact of variants.
14. Confirming positive lateral flow test results with PCR tests is important, in part because it allows samples to be obtained for sequencing.

**ACTION: COG-UK, NHSE and NHSTT** to consider potential options to increase proportion of samples from hospitals which are sequenced.

**ACTION: PHE** to continue to prioritise control of variants and policymakers to factor risk into policy choices.

### **Vaccine updates and efficacy against new variants**

15. SARS-CoV-2 is evolving antigenically (high confidence). Some variants are less well neutralized by antibodies raised to current vaccines, and the vaccine efficacy against these variants is lower than for the existing predominant virus. There is therefore a need for medium and long-term strategies for vaccination.
16. Administration of further doses of current vaccines, which are based on the spike protein from the Wuhan-like virus that emerged in 2019, might maintain and/or boost protection into winter 2021/22, but potentially less so for individuals with a less robust immune response, and less so if substantially antigenically variant viruses circulate widely.
17. Eventually it is likely that the virus will display substantial antigenic variation and current vaccines may fail to protect against transmission, infection, or even against disease caused by newer variants. Updating the vaccine to keep pace with viral evolution or searching for more broadly protective vaccines are potential solutions to this.
18. There are some things which can be learnt from the approach to updating influenza vaccines, including the potential to account for prior immunity in optimising vaccine

choice. However, there will be differences between SARS-CoV-2 and influenza, and so not all of the findings from the latter will necessarily be applicable.

19. Effective vaccine updates will require coordinated virus and immunity surveillance, which has been a strength of the UK so far, but this will also need to be linked to serology, immunology, structural biology, and viral phenotyping. The UK should build on what it has developed during the pandemic to create a sustainable hub for this.

**ACTION: UKHSA** to work with Wendy Barclay, Derek Smith and other relevant groups to outline the requirements for academic input into the system for surveillance and vaccine update. A sustainable structure is required.

### **Roadmap Modelling**

20. Modelling shows that taking step 3 of the roadmap is alone highly unlikely to put unsustainable pressure on the NHS. It is however likely to lead to R being greater than 1 in England and therefore an increase in infections. The full impact on hospitalisations and deaths will not be seen until mid-June at the earliest.
21. Modelling of both step 3 and step 4 (based on the earliest possible date for each) shows that it remains highly likely that there will be a further resurgence in hospitalisations and deaths, however, the scale, shape, and timing remain highly uncertain.
22. In most scenarios modelled, any peak in numbers of hospitalisations and deaths is smaller than any previous wave seen in England. The peaks are also smaller than modelled ahead of step 2 because new evidence suggests that vaccination may have a greater impact on transmission than previously assumed, including by reducing the extent to which vaccinated people who become infected then infect others. There has also been continued high uptake of vaccination which has contributed to the improved situation.
23. The resurgence will be smaller if baseline measures and sustained changes in behaviour which reduce transmission are maintained beyond the end of the roadmap (high confidence). The speed of vaccine rollout is also a key factor in the size of the resurgence (high confidence). The two biggest risks (absent new variants) are that either high contact patterns emerge early, or there is low vaccine rollout amongst younger adults. The combination of these two would lead to a larger resurgence.
24. If baseline policies to reduce transmission are kept in place at the end of the roadmap, behaviour does not return to pre-pandemic levels, and vaccine rollout is not substantially slowed, there is an opportunity to keep the resurgence small. Modelling of a gradual easing after step 4 shows a smaller resurgence than a faster one, as it allows more people to have been vaccinated before R increases. If there were to be a return to pre-pandemic behaviours, delaying this until as many people as possible had been vaccinated would be highly beneficial.
25. SAGE has previously provided advice on baseline measures (SAGE 87). In particular, immediate isolation on symptom onset or a positive test is a particularly effective measure if adherence is high, and there is scope to increase the effectiveness of this.
26. A variant which either substantially escapes immunity or is highly transmissible (more so than B.1.1.7) could lead to a very significant wave of infection, potentially larger than that seen in January 2021 if there were no interventions. Given the uncertainty around the properties of any such variant this modelling is based on some illustrative

- scenarios only. The central scenarios modelled do not include any impact from new variants. Reducing the number of variant infections should be a priority for policy.
27. Maintaining control of transmission of any such variants will be more difficult when there are fewer measures in place. The extinction probability of a cluster depends heavily on the size of the cluster when it is identified, and the number of clusters will increase with the rate of importation. It would therefore be worthwhile to target resources at early detection of clusters of variants, particularly as potential importations increase. The principles of responding quickly, taking strong measures, and doing so over a wider geography than where the issue has been identified should apply.
  28. There remain several sources of uncertainty in the modelling, including around the behavioural response to changes in policy (after both step 3 and step 4), the impact of any seasonal variation in transmission, the extent of waning immunity, vaccine rollout speed, and the impact of vaccination on transmission (including from asymptomatic infected people). Analysis from one model indicates that the outcomes would be expected to be worse if immunity does wane.
  29. Seasonal variation in activities including education terms and international travel patterns will affect transmission and may affect the potential for introductions of new variants. Particular consideration may be needed around the start of university terms in the Autumn including with respect to international travel to universities.

**ACTION: ONS** to consider using infection survey to estimate impact of vaccination on transmission from both symptomatic and asymptomatic infected people.

**ACTION: SAGE participants** to advise ONS of any questions which it would be useful to add to regular surveys.

#### **List of actions**

**COG-UK, NHSE** and **NHSTT** to consider potential options to increase proportion of samples from hospitals which are sequenced.

**PHE** to continue to prioritise control of variants and policymakers to factor risk into policy choices.

**UKHSA** to work with Wendy Barclay, Derek Smith and other relevant groups to outline the requirements for academic input into the system for surveillance and vaccine update. A sustainable structure is required.

**ONS** to consider using infection survey to estimate impact of vaccination on transmission from both symptomatic and asymptomatic infected people.

**SAGE participants** to advise ONS of any questions which it would be useful to add to regular surveys.

## **Attendees**

**Scientific experts (38):** Patrick Vallance (GCSA), Chris Whitty (CMO), Angela McLean (MoD, CSA), Catherine Noakes (Leeds), Calum Semple (Liverpool), Charlotte Deane (UKRI), Charlotte Watts (FCDO, CSA), Derek Smith (Cambridge), Fliss Bennee (Welsh Government), Graham Medley (LSHTM), Harry Rutter (Bath), Ian Boyd (St. Andrewes), Ian Diamond (ONS), Ian Hall (SCGW), Ian Young (Northern Ireland, Health CSA), James Rubin (KCL), Jeanelle de Gruchy (ADPH), Jennet Woolford (ONS), Jenny Harries (UKHSA), Jeremy Farrar (Wellcome), John Edmunds (LSHTM), Jonathan Van Tam (dCMO), Kamlesh Khunti (Leicester), Linda Partridge (Royal Society), Lucy Yardley (Bristol/Southampton), Maria Zambon (PHE) Mark Walport (UKRI), Mark Wilcox (Leeds), Michael Parker (Oxford), Meera Chand (PHE), Nicola Steedman (Scottish Government, dCMO), Peter Horby (Oxford), Rob Orford (Welsh Government, Health CSA), Sharon Peacock (PHE), Steve Powis (NHS England), Susan Hopkins (PHE/NHST&T), Wei Shen Lim (Nottingham), and Wendy Barclay (Imperial).

**Observers and government officials (22):** Alan Penn (MHCLG, CSA), Andrew Curran (HSE, CSA), ██████████, Ben Warner (No.10), Christopher Williams (PHW), Daniel Kleinberg (Scottish Government), David Lamberti (DHSC), Fergus Cumming (DHSC/JBC), Giri Shankar (PHW), James Benford (HMT), Jennifer Rubin (HO, CSA), Jim McMenamin (Health Protection Scotland), Julian Fletcher (CO), ██████████, Liz Lalley (Welsh Government), ██████████, Osama Rahman (DfE, CSA), ██████████, ██████████, Paul Monks (BEIS, CSA), Phil Blythe (DfT, CSA), Rob Harrison (CO) and ██████████.

**Secretariat (all GO-Science) (16):** ██████████, ██████████, ██████████, ██████████, ██████████, ██████████, ██████████, ██████████, ██████████, ██████████, ██████████, ██████████, ██████████, ██████████, ██████████, ██████████, Simon Whitfield, Stuart Wainwright, ██████████ and Zoe Bond.

**Total: 76**