Eighty-third SAGE meeting on COVID-19, 11 March 2021

Held via Video Teleconference

Summary

1. The number of new infections and hospital admissions continues to decline. R in the UK, England, Scotland, and Wales is estimated to be between 0.6 and 0.8, and between 0.6 and 0.9 in Northern Ireland. The growth rate in new infections in the UK is between -7% and -4% per day.
2. Prevalence of some variants of concern (e.g. P.1 and B.1.351) is increasing in some parts of Europe and in some regions is very high. The measures that have been put in place for returning travellers will have reduced the risk of importation and onward transmission of these variants in the UK, although there is a significant number of people who are exempt from these measures. The impact of any importation of new variants will depend on the properties of that variant, in particular the degree of immune escape from vaccine-induced or naturally-acquired immunity.
3. To know when to update vaccines, a good understanding of the correlates of protection is needed. It is also important to be able to measure these and monitor at a population level. This work is ongoing and needs to be developed.
4. From analysis of clinical trial results and laboratory studies, a provisional conclusion is that as the neutralising antibody (NAb) titres fall against variants, a decrease in vaccine efficacy is expected. The extent of the decrease will depend on type of vaccine, starting antibody titre after immunisation, time after immunisation and antigenic distance of the variant vs the vaccine immunogen.[1]
5. The UK will need an effective system for considering mechanisms for vaccine updates. This is a global issue, and an internationally agreed approach will also be needed.
6. Given the limited available evidence, it is not known what impact greater use of FFP3 masks would have on overall levels of transmission in healthcare workers (although the limitations of the evidence should not be taken to show an absence of effect).
7. Modelling indicates that daily testing of contacts of confirmed cases of COVID-19 may offer a supplement or alternative to quarantine strategies. In some scenarios, daily testing offers a similar level of effectiveness to quarantine in reducing transmission. The modelled impact is highly dependent on behavioural factors (in particular, levels of adherence for each approach), much of which is currently unknown, and which would need careful consideration.

Situation Update

8. The number of new infections and hospital admissions continues to decline. R in the UK, England, Scotland, and Wales is estimated to be between 0.6 and 0.8, and between 0.6 and 0.9 in Northern Ireland. The growth rate in new infections in the UK is between -7% and -4% per day. Estimates lag changes in transmission by two to three weeks.
9. There are currently estimated to be between 5,000 and 12,000 new infections per day in England. For the most recent week of the study (28th February to 6th March) the ONS Community Infection Survey estimates that an average of 200,600 people had COVID-19 in the community in England (credible interval 180,200 to 222,900).

[1] Amended on 18/03/2021, and minutes re-issued post amendment. The previous text referred to specific changes in neutralisation and/or efficacy which may not be generalisable.

10. There remain some small areas where the number of new infections is not declining. Work is underway to understand the characteristics of these areas to understand if anything can be learnt about these communities or settings within them.
11. Data are not currently published that allow SPI-M (or others) to assess the impact of the test, trace, and isolate systems on wider transmission. Metrics such as the proportion of symptomatic people requesting a test who have already been told to self-isolate as a result of contact tracing (and similar metrics for those being admitted to hospital) would enable such an assessment.
12. PHE is continuing to work on understanding the relationship between the sensitivity of lateral flow tests and PCR tests, and the ability to culture virus. A recent preprint[2] suggests that lateral flow tests have good sensitivity in cases where virus can be cultured (i.e. those people most likely to be infectious). This supports the use of lateral flow devices to find cases which may not otherwise be identified (e.g. use for asymptomatic testing).
13. The vaccination programme is continuing at pace. CO-CIN analysis shows that of those people who have been hospitalised and tested positive for COVID-19 after being vaccinated, the majority of these developed symptoms before immunity would be expected to have developed, with few developing symptoms more than 2 weeks post-vaccination (with at least a first dose).
14. The observation that a significant number of people developing symptoms within a few days of a first dose may suggest some behaviour change following vaccination (and before immunity has developed). It is important therefore that communications around vaccination reinforce the need for safe behaviours to be maintained. It may also be the case that some infections occur during the end-to-end process of vaccination (i.e. including journeys to and from vaccination). The low number of people in the study with symptom onset in the days prior to vaccination is expected, as most people with symptoms would not attend their vaccination appointments. Many of those included in the study would have been vaccinated at a time when community prevalence was very high.
15. Although the COVID-19 vaccines in use in the UK are highly effective, no vaccine is 100% effective, and some people will be hospitalised with COVID-19 even after completing their full vaccination schedule (high confidence). It will be particularly important to monitor the prevalence of different variants present in this group by sequencing to understand any potential immune escape. This is underway by PHE.
16. PHE and JBC continue to monitor and assess new variants. Prevalence of some variants of concern (VoC) is increasing in some parts of Europe. Evidence from other countries is often limited but some European countries have areas of high prevalence of variants including P.1 and B.1.351. It is important that the results of genomic surveillance are shared with COG-UK and that sequencing of those in hotel quarantine is included. New assays to identify variants provide a useful additional tool to whole genome sequencing. Importation of VoCs from Europe is highly likely (high confidence).
17. The measures which have been put in place for returning travellers will have reduced the risk of importation and onward transmission of these variants in the UK to some extent, though there is a significant number of people who are exempt from these measures. Some will be covered by a different testing regime where positive results may not go on to be sequenced, and where data may not feed into the public health system. The more people who are exempt from the measures, the higher the risk of undetected importation of a new variant.

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[2] Pickering, et al. (2021), Comparative performance of SARS CoV-2 lateral flow antigen tests demonstrates their utility for high sensitivity detection of infectious virus in clinical specimens, available from, https://www.medrxiv.org/content/10.1101/2021.02.27.21252427v1 (accessed 12/03/2021).

18. The impact of any importation of new variants will depend on the properties of that variant, in particular the degree of immune escape from vaccine induced or naturally acquired immunity.

ACTION: SPI-M, NHSE and **NHSTT** to meet to consider whether the proportion of COVID-19 hospital admissions who have been contacted by NHSTT can be measured; **NHSE** and **NHSTT** to review data linkages as required.

Updating Vaccines in Response to Viral Evolution

19. Two variants of concern have been identified which have consistently measurable antigenic distance from the progenitor Wuhan-like virus. These are B.1.351, first identified in South Africa and P.1, first identified in Japan amongst travellers from Brazil. Evidence continues to suggest that there is little antigenic distance between B.1.1.7 and earlier viruses.
20. Overall, evidence from clinical trials suggests a modest decrease in vaccine efficacy against B.1.351 infection. Fewer data are available for efficacy against P.1 infection.
21. To know when to update vaccines, a good understanding of the correlates of protection is needed. It is also important to be able to measure these and monitor at a population level. Serum antibody titre in a live virus neutralization assay is the most reliable correlate identified so far.
22. From analysis of clinical trial results and laboratory studies, a provisional conclusion is that as the neutralising antibody (NAb) titres fall against variants, a decrease in vaccine efficacy is expected. The extent of the decrease will depend on type of vaccine, starting antibody titre after immunisation, time after immunisation and antigenic distance of the variant vs the vaccine immunogen.[3]
23. It will be necessary to develop a vaccine strain selection and update process. This may begin with adapting existing processes such as that for influenza vaccine strain updates, but it will be important to recognise the current uncertainty around SARS-CoV-2 antigenic variation and immunity.
24. There are costs and benefits of a vaccine update and associated risks, especially in the face of the mass production and global distribution already required to achieve a level of immune protection afforded by current vaccines throughout the world.
25. The decision on the need to update vaccines in the short term will partly depend on whether vaccines are being used to protect against severe disease, or against transmission (for which a higher antibody titre or better matched immune response may be required).
26. The UK will need an effective system for considering these issues and providing assurance. This is a global issue, and an internationally agreed approach will also be needed.
27. It is important to consider how antigenic evolution of the virus might impact vaccine decisions in the longer term, and a vaccine strategy for different potential future scenarios might be required. Laboratory work to understand what evolutions may emerge is taking place.
28. Further work is needed to define and refine the estimate of correlates of protection and quantify antigenic differences between variants. Trials will also be needed for additional doses and vaccines targeting new variants.

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[3] Amended on 18/03/2021, and minutes re-issued post amendment. The previous text referred to specific changes in neutralisation and/or efficacy which may not be generalisable.

ACTION: Wendy Barclay to consider what further steps the UK needs to take to develop a system which can determine the need for vaccine updates, and report back to GCSA and SAGE as needed (responsibility for implementing such a system is likely to fall to DHSC or NIHP).

Masks in healthcare settings

29. Evidence shows that there is variation in both nosocomial infection rates and healthcare worker (HCW) infection rates, which cannot be explained by levels of respiratory protection alone. Key drivers of nosocomial infection are the community infection rate and hospital occupancy.
30. Lateral flow device (LFD) testing data from HCWs shows that HCW positivity has remained less than 1% throughout the period from December 2020 to March 2021, and current data shows signs that HCW positivity is decreasing further (likely due in part to vaccination).
31. Infection prevention and control (IPC) measures consist of a hierarchy of controls and there are a number of tiers in the hierarchy that should be considered before PPE, which are likely to be equally or more effective in terms of controlling risk and exposure.
32. There is a correlation between more effective NHS Trusts and lower rates of nosocomial infection. This supports the hypothesis that good practice following current guidelines reduces infection rates. Local risk assessments which can account for factors specific to particular settings are often beneficial and a number of individual NHS trusts have these in place.
33. Transmission occurs through several routes, including droplets, aerosols, and fomites. These routes often occur together and at the same time, which makes it difficult to distinguish the extent to which individual routes contribute to transmission. Air sampling is difficult, and the lack of virus identified in a sample does not mean it is not present in an environment. The overall contribution of aerosols to transmission in healthcare settings is therefore unclear.
34. There remains limited evidence around the effectiveness of different masks in healthcare settings. Much of the evidence comes from before and after studies, which are not always controlled, and no randomised controlled trials (RCTs) have been carried out so far, although one around FFP3 masks is being planned in Canada.
35. Fit-tested FFP3 respirators provide a higher level of protection to the wearer against aerosol/ airborne transmission than fluid resistant surgical masks.
36. UK IPC guidance and that issued by the World Health Organisation (WHO) both recommend that HCWs routinely wear face masks while COVID-19 is endemic, and that FFP3 and similar types of respirator masks are recommended for use where aerosol generating procedures (AGPs) are in place for a suspected or confirmed COVID-19 patient.
37. Decisions on policies on mask usage for HCWs lie within the NHS. Given the limited available evidence, it is not known what impact greater use of FFP3 masks would have on overall levels of transmission in HCWs (though the limitations of the evidence should not be taken to show an absence of effect). Decision makers will need to consider the extent to which they take a precautionary approach and will also need to consider other factors beyond the remit of SAGE.
38. Well-designed clinical trials may address the absence of evidence and improve understanding of the effectiveness of masks in healthcare settings.

ACTION: Mark Wilcox to update paper to include additional evidence and reflect the discussion at SAGE, with input from EMG, and to return to SAGE when ready.

Testing strategies

39. Modelling indicates that daily testing of contacts of confirmed cases of COVID-19 may offer a supplement or alternative to quarantine strategies. In some scenarios, daily testing offers a similar level of effectiveness to quarantine in reducing transmission. The modelled impact is highly dependent on behavioural factors (in particular, levels of adherence for each approach), much of which is currently unknown and which would need careful consideration.
40. Daily testing approaches may also offer other benefits in some circumstances (e.g. fewer days of education missed if used in schools) (low confidence). Defining the aims is also important for any testing strategy as there will be trade-offs in some cases between reducing transmission and other objectives.
41. NHSTT is undertaking trials to understand the impact on behaviours of replacing quarantine with daily testing in particular groups (including schools).
42. Any further in-depth analysis of testing strategies will require additional data to that which is currently available, which these trials may provide. Trials and pilots to assess the uncertainties are strongly endorsed by SAGE.

ACTION: SPI-M to update paper on testing strategies to highlight uncertainties and need for trials.

List of actions

SPI-M, NHSE and **NHSTT** to meet to consider whether the proportion of COVID-19 hospital admissions who have been contacted by NHSTT can be measured; **NHSE** and **NHSTT** to review data linkages as required.

Wendy Barclay to consider what further steps the UK needs to take to develop a system which can determine the need for vaccine updates, and report back to GCSA and SAGE as needed (responsibility for implementing such a system is likely to fall to DHSC or NIHP).

Mark Wilcox to update paper to include additional evidence and reflect the discussion at SAGE, with input from EMG, and to return to SAGE when ready.

SPI-M to update paper on testing strategies to highlight uncertainties and need for trials.

Attendees

Scientific experts (42): *Patrick Vallance (GCSA), Chris Whitty (CMO), Angela McLean (MOD), Calum Semple (Liverpool), Catherine Noakes (Leeds), Charlotte Deane (UKRI), Charlotte Watts (FCDO CSA), Chris Dye (Royal Society), Chris Savoury (DHSC), Clare Gardiner (DHSC), Colin Humphreys (Queen Mary), David Crossman (Scotland), Derek Smith (Cambridge), Fliss Bennee (Wales), Graham Medley (LSHTM), Harry Rutter (Bath), Ian Boyd (St Andrews), Ian Diamond (ONS), James Rubin (KCL), Jeanelle de Gruchy (ADPH), Jenny Harries (DHSC), Jeremy Farrar (Wellcome), John Edmunds (LSHTM), Kamlesh Khunti (Leicester), Linda Partridge (Royal Society), Lucy Yardley (Bristol/Southampton),* [redacted]*, Maria Zambon (PHE), Mark Walport (UKRI), Mark Wilcox (NHS), Michael Parker (Oxford), Nicola Steedman (Scotland dCMO), Paul Cleary (DHSC), Peter Horby (Oxford), Rob Orford (Wales, Health CSA), Sharon Peacock*

(PHE), Stephen Powis (NHS England), Stuart Elborn (QUB), Susan Hopkins (PHE/NHST&T), Wei Shen Lim (JCVI), Wendy Barclay (Imperial), and Yvonne Doyle (PHE).

Observers and government officials (29): *Achim Wolf (NHSTT), Alan Penn (MHCLG CSA), Andrew Curran (HSE CSA), Andrew Morris (HDR UK), [redacted], Ben Warner (No.10), [redacted] Christopher Williams (PHW), Daniel Kleinberg (Scotland), [redacted] Gideon Henderson (Defra CSA), Giri Shankar (PHW), Jennifer Rubin (HO CSA), Jim McMenamin (HPS), Julian Fletcher (CO), Laura Gilbert (No.10), [redacted] Liz Lalley (WG), Louise Tinsley (HMT), [redacted] Osama Rahman (DfE CSA), [redacted] Paul Monks (BEIS CSA), [redacted] Phil Blythe (DfT CSA), [redacted] Rob Harrison (CO), Tom Mottershead (DHSC), and Tom Rodden (DCMS CSA).*

Secretariat (all GO-Science) (19): [redacted] *Laura Eden,* [redacted] *Simon Whitfield, Stuart Wainwright,* [redacted] *and* [redacted].

Total: 90