Seventy-eighth SAGE meeting on COVID-19, 28th January 2021
Held via Video Teleconference

Summary

1. Deaths and hospital admissions remain at very high levels. The number of hospital admissions lags new infections and is now slowly decreasing. Hospital occupancy remains at a very high level and will remain high for some time. ICU admissions and deaths lag hospital admissions and are not yet falling.
2. SPI-M's best estimate for R in the UK is between 0.7 and 1.1, while England is between 0.7 and 1.0. Estimates of R for Scotland, Wales, and Northern Ireland are between 0.7 and 1.0, 0.7 and 0.9, and 0.7 and 1.1 respectively. The growth rate in the UK is estimated to be between -5% and 0% per day, and between -4% and 0% in England. The decrease in the number of positive pillar 2 tests each day is faster than this, which may be related to changes in the number of people with symptoms taking tests or increases in the proportion of lateral flow tests.
3. Current estimates are that 20%-40% of the population have had a primary infection or been vaccinated (medium confidence), peaking in young adults and lowest in the youngest and oldest age groups (but changing rapidly in the oldest groups as they are vaccinated). The proportion immune to infection is slightly lower due to waning or partial immunity (high confidence).
4. Studies of the B.1.351 variant (first identified in South Africa) show greater reductions in the ability of sera to neutralise the virus. The clinical impact of this is unclear, but there is cause for concern about the possibility of antigenic escape (medium confidence). Available evidence currently suggests that B.1.1.7 (currently dominant in the UK) is not associated with significant antigenic escape from naturally-acquired or vaccine-induced immunity (medium-high confidence).
5. SAGE has previously advised that the opening and closing of schools is likely to have an impact on transmission and R, and that policymakers need to consider the balance of risks and harms. The opening of primary and secondary schools is likely to increase effective R by a factor of 1.1 to 1.5 (10% to 50%) (medium confidence). Options with fewer children in attendance (such as selected year groups or cohorts) are likely to fall towards the lower end of this range. While prevalence is falling and vaccinations are continuing, a later opening of schools would result in less community transmission and fewer hospitalisations. Attending school is important for the wellbeing of children and SAGE advises that reopening schools should be a priority when infection rates allow it.
6. In the past month, significant increases in transmission and mortality have been reported in almost every region of the world. Whilst these increases may, in part, be due to behaviours during the festive period, the rapid increase is likely to be predominantly due to the emergence and spread of more transmissible variants (medium confidence, low evidence). Aside from the significant human and social costs around the world, ongoing transmission in other countries would continue to pose a threat to UK health even if the epidemic were under control in this country and a high proportion of the population were vaccinated.

Situation Update

7. Deaths and hospital admissions remain at very high levels. The number of hospital admissions lags new infections and is now slowly decreasing. Hospital occupancy remains at a very high level and will remain high for some time. ICU admissions and deaths lag hospital admissions and are not yet falling.
8. SPI-M estimates that there are between 56,000 and 130,000 new infections per day in England. The ONS community infection survey for the most recent week of the study (17th to 23rd January) estimates that an average of 1,018,700 people had

COVID-19 in the community in England (credible interval 976,200 to 1,061,600). These are broadly in line with previous weeks, showing a near-flat or slowly declining epidemic. The latest data from the REACT study are also consistent with this.

9. SPI-M's best estimate for R in the UK is between 0.7 and 1.1, while England is between 0.7 and 1.0. Estimates of R for Scotland, Wales, and Northern Ireland are between 0.7 and 1.0, 0.7 and 0.9, and 0.7 and 1.1 respectively, based on data up to 25th January, including hospitalisations and deaths as well as symptomatic testing and prevalence studies. The growth rate in the UK is estimated to be between -5% and 0% per day, and between -4% and 0% in England.
10. The decrease in the number of positive pillar 2 tests each day is faster than this. The reasons for this divergence are not fully understood. Positivity rates in many regions have not decreased alongside the number of positive tests, which suggests that fewer people with symptoms coming forward for testing may be one factor. The increasing proportion of lateral flow tests may be another. Changes in the types of test use means that testing data are not necessarily comparable over time. Surveillance studies remain the most reliable methodology to assess prevalence.
11. There is heterogeneity by age group and by region. Testing data show high prevalence in over-80s, as well as the working age population. SPI-M estimates of R are below 1 in London, East and South East of England, and span 1 in other regions of England.
12. Current estimates are that 20%-40% of the population have had a primary infection or been vaccinated (medium confidence), peaking in young adults and lowest in the youngest and oldest age groups. The proportion immune to infection is slightly lower due to waning or partial immunity (high confidence).
13. SPI-M projections include the potential impact of vaccinations. There is a lag between vaccination and any prevention of infection, hospitalisation and death. The impact on deaths will likely be seen first as vaccinations have been targeted at the most vulnerable groups, and deaths are more skewed towards these groups than hospitalisations or infections.
14. CO-CIN analysis of the demographics of those admitted to hospital was endorsed by SAGE. This indicates that around 30% of hospital admissions were in people under 60, and 30% of deaths of people in the CO-CIN study were under 75. The increased proportion of younger women admitted to hospital was noted and the reason is unclear. SAGE supported public health researchers having appropriate access to patient data.
15. ONS analysis indicates that over 300,000 people in the UK may have one or more potential symptoms of long COVID. Separate analysis indicates that a significant proportion of people hospitalised with COVID-19 go on to be re-hospitalised. SAGE will review this in more detail at its next meeting.

ACTION: Calum Semple to update presentation of CO-CIN analysis to reflect SAGE comments

ACTION: NHSTT, PHE and **DAs** to review processes for reporting of lateral flow tests

ACTION: PHE to assess the divergence of pillar 2 testing and ONS/REACT survey data including potential changes in behaviour in people seeking tests

New variants

16. For the B.1.1.7 variant (which is now dominant in the UK), data indicate a modest difference in ability of sera to neutralise compared to wild-type variant. The clinical significance of this is unclear, as the correlates of immunity are not well understood.

Available evidence currently suggests that B.1.1.7 is not associated with significant antigenic escape from naturally-acquired or vaccine-induced immunity (medium-high confidence).

17. There is no further evidence available on severity of disease caused by infection with B.1.1.7, and there is unlikely to be significant new evidence for several weeks. There remains high confidence that B.1.1.7 can spread faster than other variants currently circulating in the UK.
18. There is epidemiological evidence to suggest that variant B.1.351, first identified in South Africa, is associated with increased transmission (medium confidence). Further information is needed to confirm this finding. For the variant P.1, first identified in Japan in travellers from Brazil, there is insufficient evidence to determine whether it is associated with changes in transmissibility or disease severity (but an increase in transmissibility would be biologically plausible). Both of these variants have E484K and N501Y mutations, as well as an amino acid change at position 417.
19. Studies of the B.1.351 variant show greater reductions in the ability of sera to neutralise the virus. The clinical impact of this is unclear, but there is cause for concern about the possibility of antigenic escape (low-medium confidence).
20. At the time of the last analysis of available data, of 76 cases of B.1.351 in England, 8 had not been linked to travel (directly or via contacts) based on the data available so far. PHE is undertaking further investigations.
21. A group has been formed to better understand antigenicity and how changes in neutralisation should be interpreted.
22. It will be important to consider options for long-term surveillance of variants, including whether there could be a role for wastewater testing.
23. SAGE endorsed the NERVTAG papers on the three variants (B.1.1.7, B.1.351 and P.1).

Impact of school reopening

24. Evidence continues to confirm that children are susceptible to COVID-19 infection, with primary aged children having lower susceptibility of infection than older children (medium confidence). There continues to be strong evidence that children and younger people (<19 years) are much less susceptible to severe clinical disease than older people (high confidence). Due to the small numbers of severe cases, there is insufficient information to make any statement on whether B.1.1.7 results in any difference in severity in children. ONS infection survey data suggest that the B.1.1.7 variant leads to higher infection rates but is not particularly adapted to any age group (medium confidence).
25. SAGE has previously advised that the opening and closing of schools is likely to have an impact on transmission and R, and that policymakers need to consider the balance of risks and harms including the potential direct health risks to children and staff from COVID-19; the wider impact of school opening on community transmission; and the direct risks to student mental health, wellbeing, development, educational attainment, and lifetime health outcomes from school closure.
26. The extent of the impact on transmission and the role played by transmission within schools versus transmission in the wider community associated with schools being opened remains uncertain and difficult to quantify. Whilst secondary schools may have more transmission within the school, primary schools may have more effect on the wider community (e.g. by enabling adults to go to work or do other activities). It is unclear whether primary or secondary schools have the greater impact on overall transmission. Emergence of the B.1.1.7 variant has increased this uncertainty but has almost certainly increased the rate of transmission when schools are open.
27. SPI-M-O's consensus view is that the opening of primary and secondary schools is likely to increase effective R by a factor of 1.1 to 1.5 (10% to 50%) (medium

confidence). Options with fewer children in attendance (such as selected year groups or cohorts) are likely to fall towards the lower end of this range (medium confidence).

28. The major determinants on the impact of opening schools are the community prevalence and proportion of people vaccinated. While prevalence is falling and vaccinations are continuing, a later opening of schools results in less community transmission and fewer hospitalisations.
29. It is possible that regional differences in R, prevalence, and incidence may mean that some areas could have "headroom" to relax measures or open some schools before others. An initial limited and cautious reopening of schools (e.g. primary schools only) for a time limited period, in the absence of easing other restrictions, might allow for an assessment of the impact on community transmission. If other interventions or restrictions were to be changed at around the same time, considering the interaction would be important.
30. Latest ONS analysis continues to suggest that rates of death for men and women working in teaching and educational locations is comparable to other professional occupations and are lower than rates of death in the wider population (low confidence). However, new analysis suggests that men working in secondary education may have a higher risk of COVID-19 mortality than comparable men in other professional occupations (low confidence).
31. There is still clear evidence of the negative educational impact of missing school as well as evidence that school closures cause impairment to the physical and mental health of children. One systematic review concluded that school closures as part of broader social distancing measures are associated with considerable harms to children and young people's health and wellbeing including emotional, behavioural and restlessness/inattention problems and overall psychological wellbeing. Certain studies included in the review reported suggestions of greater impact in the poorest children and widening of inequalities.

ACTION: **Task and Finish Group on Children** to work with **DfE** and involve DAs in ongoing work assessing the evidence on impact of school closures on children and the effectiveness of mitigations

International issues

32. Globally, more than 100m people have been reported infected by COVID-19, with over 2.1m deaths. The human and social costs are significant, most especially for those living in areas of extreme poverty where economic scarring will last for many years. There is also an under-ascertainment of cases and the number of deaths. Differences in capacity, scale and strategies for testing make direct comparisons in infection and mortality rates between countries challenging, particularly those at different income levels.
33. In the past month, significant increases in transmission and mortality have been reported in almost every region of the world. Whilst these increases may, in part, be due to behaviours during the festive period, the rapid increase is likely to be predominantly due to the emergence and spread of more transmissible variants (medium confidence, low evidence). This has significant implications for global control. For some variants, increased transmission may be a consequence of escape from naturally acquired immunity (low confidence, low evidence). If confirmed, this would have a major impact on future epidemiological trajectories.
34. Any immune escape risks new, more severe waves of infection in settings that have experienced previous outbreaks, on top of the risk of transmission in areas that have previously been less affected (e.g. more dispersed populations) (moderate confidence, low evidence).
35. As such, and aside from the significant human and social costs around the world, ongoing transmission in other countries would continue to pose a threat to UK health even if the epidemic were under control in this country and a high proportion of the population were vaccinated.

36. This highlights the critical importance of a strong global response to COVID-19. The variants currently known about have largely been identified in countries with high sequencing capacity or with dedicated research investigations. There are significant blind-spots in genomic surveillance, which hinder the rapid identification of emerging variants globally (weak evidence, high confidence). Increased global genomic surveillance, that supplements essential testing and surveillance regimes, will be critical to understand mechanisms of viral strain replacement, especially in the context of widespread vaccine roll-out.
37. Many countries face challenging health resource allocation decisions with difficult trade-offs between competing priorities across all health in a fiscally constrained environment. Testing capacity remains highly centralised in many countries and is often insufficient to meet current demand. It is important to use the global allocation of initial vaccine doses to achieve health impact as well as equity, but the scale of globally available vaccines in 2021 remains an unknown.
38. The magnitude of the indirect impacts of COVID-19 globally, particularly for the poorest countries, is significantly exceeding direct impacts. In many countries, the indirect impact on health outcomes is highly likely to be greater than the direct impact in terms of cases and deaths.
39. UK science can provide evidence which will be of importance in other countries. In particular, the UK is well-placed to provide evidence of the impact of different vaccination regimes including delayed second doses and SAGE endorses assessing this and making the data public as soon as possible. Research which helps to define correlates of protection will also be valuable, as will trials of low-cost, widely-available therapeutics.

ACTION: **FCDO** to set out next steps and follow up with relevant people and departments

List of actions

Calum Semple to update presentation of CO-CIN analysis to reflect SAGE comments.

NHSTT, PHE and **DAs** to review processes for reporting of lateral flow tests.

PHE to assess why positive test numbers may be falling faster than true incidence including potential changes in behaviour in people seeking tests.

Task and Finish Group on Children and **DfE** to involve DAs in ongoing work assessing the evidence on impact of school closures on children and the effectiveness of mitigations.

FCDO to set out next steps and follow up with relevant people and departments.

Attendees

Scientific experts (34): *Patrick Vallance (GCSA), Chris Whitty (CMO), Angela McLean (MOD), Brooke Rogers (KCL), Calum Semple (Liverpool), Catherine Noakes (Leeds), Charlotte Watts (FCDO CSA), Fliss Bennee (Technical Advisory Cell, Wales), Graham Medley (LSHTM), Harry Rutter (Bath), Ian Boyd (St Andrews), Ian Diamond (ONS), Jeanelle de Gruchy (ADPH), Jenny Harries (DHSC), Jeremy Farrar (Wellcome), John Edmunds (LSHTM), Jonathan Van-Tam (dCMO), Julia Gog (Cambridge), Kamlesh Kunti (Leicester), Linda Partridge (Royal Society), Maria Zambon (PHE), Mark Walport (UKRI), Mark Wilcox (NHS),* [redacted] *Michael Parker (Oxford), Nicola Steedman (Scotland, dCMO), Peter Horby (Oxford), Phil Blythe (DfT CSA), Rob Orford (Wales, Health CSA), Sharon Peacock (PHE), Stephen Powis (NHS England), Susan Hopkins (PHE/NHST&T), Wendy Barclay (Imperial), Yvonne Doyle (PHE)*

Observers and government officials (25): *James Benford (HMT),* [redacted] *Andrew Curran (HSE, CSA), Stuart Elborn (NI), Julian Fletcher (CO),* [redacted] *Robin Grimes (JBC CSA), Rob Harrison (CO),* [redacted] *Catherine Huntley (DHSC),* [redacted] *Chris Lewis (FCDO), Jim McMenamin (Health Protection Scotland), Paul Monks (BEIS CSA), Andrew Morris (HDR UK), Elizabeth Morrison (Scotland), Alan Penn (MHCLG, CSA),* [redacted] *Tom Rodden (DCMS CSA) Jennifer Rubin (HO CSA), Rupert Shute (HO dCSA), Ben Warner (No.10)*

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

Total: 81