One hundred and first SAGE meeting on COVID-19, 23 December 2021
Held via Video Teleconference

Situation update

1. The number of Omicron infections continues to grow quickly across the country. Although there is an apparent slowing of growth rates, UKHSA data suggest doubling times in most of the country are still in the region of 2-3 days and, importantly, test positivity rates are still rising. In London, infection rates and hospitalisations are rising fast.
2. The apparent fall in the rate of growth may be a genuine slowing related to changes in mixing patterns or behaviours (e.g. people reducing risk prior to the festive period or the impact of moving to Plan B in England). It could also be related to different rates of spread amongst different groups or to a reduction in the remaining number of susceptible people in some sub-groups. Changes in testing behaviours in the lead up to the Christmas weekend are also a possible factor, in which case it may not be a genuine slowing.
3. The number of people in hospital with Omicron infection continues to increase with a doubling time of around 4-5 days. Some of this increase is due to nosocomial transmission including in mental health hospitals. Infections have been concentrated in younger age groups to date; hospitalisation rates will increase as older age groups are infected. As infections move into older age groups, a large wave of hospital admissions should be expected.
4. Data will be unreliable over the festive period as testing and hospital admission patterns change. This will make it difficult to interpret any apparent trends over the next few days. UKHSA is working with the NHS to obtain as much data as possible including genotyping data before Christmas. The ONS infection survey will remain the best source of unbiased data in the coming weeks.
5. Multiple analyses suggest that it is likely that the intrinsic severity of Omicron is lower than that of Delta (medium confidence). There is also a decrease in the realised severity. Recent studies focus primarily on likelihood of hospitalisation although this is only one measure of severity. There remains a high degree of uncertainty as to the extent of the difference. Estimates in those infected to date range from a 15% to an 80% reduction in the risk of hospitalisation. The extent of the difference will be an important determinant of the scale of the upcoming wave of hospitalisations.
6. There is some laboratory evidence of biological differences between Omicron and Delta viruses, including in viral entry mechanisms. These might provide a plausible explanation for Omicron infection being less intrinsically severe than Delta.
7. There is some preliminary evidence emerging of changes in reported symptoms with Omicron infection (low confidence). In particular, loss of taste or smell seem to be reported less frequently.
8. Omicron infects people who have some existing protection (from vaccination and/or past infection) more than Delta does, due to its immune escape properties. Re-infections are likely to be less severe than first infections. This means that realised severity (the severity observed in a population depending on background rates of immunity and other factors that modify disease severity) will be lower than for Delta. This effect is in addition to the impact of lower intrinsic severity.
9. The most important factor in determining the proportion of infected people who go on to be hospitalised in this wave will be the age profile of those infected. There is still limited evidence as to how the intrinsic and realised severity may vary across age groups. Evidence to date is primarily from younger (but unboosted) people. Realised

severity will also be dependent on vaccine effectiveness against Omicron and how this differs by age and over time; evidence is still emerging on this.

10. Anecdotal evidence from clinicians suggests reduced severity of illness for those with Omicron infection attending hospital, albeit these are mostly younger patients (low confidence). Thresholds for hospital admission tend to change as hospitals get busier and so the case mix in hospitals may change over the course of the wave. The most dependable data on severity in hospital will be the number of patients requiring oxygen. Currently the number of people requiring oxygen is fairly stable.
11. There remain several sources of uncertainty about the scale of the anticipated wave of hospitalisations, aside from uncertainty about severity. These include the impact of behaviour change (e.g. mixing patterns and use of testing), especially over the festive period, waning of immunity, and the generation time of Omicron. There is considerable uncertainty as to how mixing patterns might change during and after the festive period. Continued availability of lateral flow tests will be important to enable people to reduce risk of transmission.
12. Generation time is a particularly important factor; if it were to be shorter for Omicron than for Delta and therefore part of the reason for the rapid growth, the anticipated wave would be smaller, and interventions would have greater effect. There is currently no evidence on whether Delta and Omicron have different generation times. Generation time will also depend in part on behaviours.
13. The peak in admissions is highly uncertain but, even with a reduction in severity, may be comparable to or higher than previous peaks in the absence of significant behaviour change or further interventions. Occupancy will depend on admissions and will also scale with length of stay (which may be reduced but there are no firm data yet).
14. The timing of the wave of hospitalisations will depend primarily on the timing of the wave of infections in older age groups. It is not possible to predict when this will be, particularly given changes to mixing patterns over the festive period, but such a wave should be expected soon given infections are increasing rapidly in all age groups and regions, and earlier in London
15. Interventions to reduce transmission that are started well before the wave of infections in older people is well underway will make a significant difference to the size of the overall peak in hospitalisations. Interventions after this point will be too late to make a significant difference to the number of infections, hospitalisations, or deaths.
16. The earlier interventions happen, and the more stringent they are, the more likely they are to be effective. Earlier interventions can produce the same or greater effect at lower stringency and applied for a shorter duration than interventions that come late. While the modelling suggests that even a few days difference in the timing of interventions can potentially make a significant difference, it is not possible to identify the current position on the epidemic curve in all different groups with precision. Intervention effectiveness to reduce hospitalisations and deaths is determined by (i) timing of introduction (ii) stringency of measures and (iii) duration they remain in place. Models give some indication of likely effect sizes under different scenarios.
17. Local heterogeneity is likely to mean that different areas may experience this wave at different times. This may mean that introducing interventions at any given point will be more effective in some areas than others and that on a national level the epidemic peak is more drawn out than modelled. Measures will be most effective in areas where the number of infections in older age groups has not yet begun to increase significantly.

18. Some epidemic waves peak below their theoretical maximum, which can happen for several reasons including because of local networks building up high levels of immunity. When this happens, the epidemic may increase again later as infection finds its way into other networks with more susceptible people.
19. Booster vaccine rollout remains very important. Antiviral drugs will be particularly useful for vulnerable individuals.

Attendees

Scientific experts (33): *Patrick Vallance (GCSA), Chris Whitty (CMO), Angela McLean (MoD, CSA), Brooke Rogers (KCL), Calum Semple (Liverpool), Catherine Noakes (Leeds), Charlotte Watts (FCDO, CSA), David Crossman (Scottish Government, Health CSA), Fliss Bennee (Welsh Government), Gavin Screaton (Oxford), Graham Medley (LSHTM), Harry Rutter (Bath), Ian Diamond (ONS), Ian Hall (Manchester), Ian Young (Northern Ireland Executive, Health CSA), Jeanelle de Gruchy (dCMO), Jenny Harries (UKHSA), John Edmunds (LSHTM), Jonathan Van Tam (dCMO), Julie Fitzpatrick (Scottish Government, CSA), Kamlesh Khunti (Leicester), Lucy Chappell (DHSC, CSA), Mark Wilcox (Leeds), Matt Keeling (Warwick), Meera Chand (UKHSA), Michael Parker (Oxford), Peter Horby (Oxford), Steve Powis (NHS England), Steven Riley (UKHSA), Susan Hopkins (UKHSA), Thomas Waite (dCMO), Wendy Barclay (Imperial) and Yvonne Doyle (NHSE).*

Observers and government officials (33): *Alan Penn (DLUHC, CSA), Andrew Curran (HSE, CSA), Andrew Morris (Edinburgh),* [redacted], [redacted], *Charlette Holt-Taylor (DHSC), Chris Lewis (FCDO), Christopher Williams (PHW),* [redacted], *Daniel Kleinberg (Scottish Government), David Lamberti (DHSC) ,* [redacted], [redacted], *Fergus Cumming (UKHSA), Gideon Henderson (Defra, CSA), Giri Shankar (PHW), Henry Cook (No. 10), Jennifer Rubin (HO, CSA), Laura Gilbert (No. 10), Liz Lalley (Welsh Government),* [redacted], [redacted], *Nicholas Broadway (HMT), Osama Rahman (DfE, CSA),* [redacted], *Paul Monks (BEIS, CSA), Paul Taylor (NPCC, CSA), Rob Harrison (CO), Rosie Bate-Williams (No. 10), Sarah Sharples (DfT, CSA),* [redacted], *Tom Rodden (DCMS, CSA) and Will Musker (No. 10).*

Secretariat (all GO-Science) (12): [redacted], [redacted], [redacted], [redacted], [redacted], [redacted], [redacted], [redacted], *Simon Whitfield, Stuart Wainwright,* [redacted] *and Zoe Bond.*

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