

SPI-M-O: Consensus Statement on COVID-19

Date: 8th September 2021

Summary

1. The UK is currently experiencing high prevalence and likely entering a period of growth as a result of changes in behaviour. It is also a time of significant uncertainty given the scope for increased transmission after the end of the school holidays, the possibility for further evidence to emerge on the duration of immunity against COVID-19, and several policy areas likely to become clearer.
2. SPI-M-O groups have reflected on their modelling of Step 4 of the Roadmap, and despite unexpected falls in cases in mid-July 2021, these scenarios can still be used to consider the future autumn and winter trajectory. This will likely be a mixture of previous scenarios but with delay in timing of peaks later in the year, with possibly broader, longer peaks than those originally estimated.
3. Until uncertainties resolve and changes in transmission are fully reflected in data – likely in three to four weeks' time - SPI-M-O's medium-term scenarios can be used to consider the next couple of months. These suggest there is the *potential* for another large wave of hospitalisations.
4. While the relationship between cases and hospitalisations has changed due to vaccination, increasing cases remain the earliest warning sign that hospital admissions are likely to rise. It also remains the case that the earlier that interventions are brought in to curb growth, the lower prevalence is kept, reducing the direct COVID-19 burden and reducing the risk of needing more stringent measures to quickly reduce transmission.
5. There is a clear consensus that continued high levels of homeworking has played a very important role in preventing sustained epidemic growth in recent months. It is highly likely that a significant decrease in homeworking in the next few months would result in a rapid increase in hospital admissions.
6. If enacted early enough, a relatively light set of measures could be sufficient to curb sustained growth. During a period of sustained epidemic growth, however, the more stringent the measures introduced, the shorter the duration needed for the measures to be in place to reduce to a given prevalence.

Current epidemic estimates

7. UK Health Security Agency's best estimate for R in England is between 0.9 and 1.1 and the growth rate is between -1% and +1% per day, based on data available up to 6th September. R is a lagging indicator, reflecting the state of the epidemic approximately two

to three weeks ago. While many of the data streams appear to be flat presently and the epidemic in England in particular appears to be in equilibrium, there are many subtleties and complex dynamics underpinning that high-level picture, especially across age groups and within regions.

8. Prevalence has remained high for some weeks, and hospital admissions in older population have increased, albeit relatively slowly from a low base. It is unclear how high prevalence and admissions may go without intervention. While it is too early to observe in the data, it is possible that transmission will increase as the majority of schools have now returned in England and many adults are returning to the office after an extended period of working from home.

Reflections on modelling Step 4 of the Roadmap

9. SPI-M-O previously considered results from three academic groups who independently modelled taking Step 4 of the Roadmap on 19th July¹. **All results were highly sensitive to the modelling assumptions and the data trajectories at the time**, and extensive sensitivity analyses were performed. This modelling was conducted at a time when cases were increasing rapidly, yet this was followed by a sharp, synchronous decline following a peak in UK daily cases on 15th July.
10. The modelling did not foresee such rapid transient change in dynamics, with possible reasons including the closure of schools for the summer, changes in behaviour during and following the Euro 2020 football matches, a period of warm weather, and a large proportion of the population isolating as a result of being identified as a contact of a case, as discussed in a previous consensus statement². Outturn data for hospital admissions over the month of August did, nevertheless, fall within expectations for some scenarios, although hospital occupancy and deaths have been lower than expected under central vaccination assumptions. It is, however, still possible to use these scenarios to understand plausible future trajectories over the next few months into winter.
11. The group from Imperial College London has updated the modelling they conducted for Step 4 of the Roadmap³ since 19th July. In this, they fit to data up to 23rd August and assume more gradual changes in behaviour than their original Step 4 Roadmap modelling. These latest results suggest that while no scenario can be ruled out completely, their latest

¹ [SPI-M-O: Summary of further modelling of easing restrictions – Roadmap Step 4 on 19th July 2021](#) and underlying modelling papers from [Imperial College London](#), [London School of Hygiene and Tropical Medicine \(LSHTM\)](#), and [Warwick University](#); SAGE 93 7th July 2021

² [SPI-M-O: Consensus statement on COVID-19](#), 28th July 2021

³ [Non-pharmaceutical interventions, vaccination and the Delta variant: epidemiological insights from modelling England's COVID-19 roadmap out of lockdown](#); 18th August 2021

optimistic or central vaccine effectiveness scenarios with a gradual return to high or central mixing rates are closest to the situation currently seen.

12. Imperial's modelling does not account for any substantial waning of immunity over the time period considered (apart from their pessimistic scenarios which assume a three-year average duration of infection-induced immunity), nor does it consider any variants of concern beyond Delta⁴.
13. The group from Warwick University has also reflected on their modelling of Step 4 of the Roadmap on 19th July and also conclude that changes in mixing patterns have been more gradual than many of the scenarios considered at the time.
14. Again, none of their scenarios fully align with the observed dynamics in pillar 2 cases due to unexpected behaviour, and its impacts on transmission, in July 2021. **It is likely that the future trajectory of the epidemic may be some combination of the Step 4 Roadmap scenarios but with a delay of any peak**, for example with peaks occurring in October to December instead of August to October.
15. For hospital admissions, Warwick's medium initial change in precautionary behaviours with gradual return to pre-pandemic levels over five months and small initial change in precautionary behaviours with gradual return to pre-pandemic levels over three months scenarios most closely match the hospitalisations observed in England to date. The decline seen in these modelled scenarios during September and October 2021, however, is unlikely given the continued increase in case numbers seen.
16. The large-scale outbreaks that were considered feasible after taking Step 4 have not been seen and the population has not reduced their cautious behaviours as dramatically as was considered possible. Given the large number of infections that have occurred in recent months and the additional vaccine doses delivered, it is unlikely that the highest levels seen in Step 4 Roadmap scenarios from July will be reached *without waning immunity* (see paragraph 17) *or a novel variant emerging*. It is also possible that the epidemic peak could be flatter and/or broader than those seen in Step 4 Roadmap modelling scenarios.
17. There remain challenges in comparing the current situation and possible futures with the modelling conducted before Step 4 of the Roadmap was taken:
 - *Behaviour was assumed to be consistent across age groups*, and, while this may hold when external changes such as imposed non-pharmaceutical interventions drive behaviour, it may be more heterogeneous currently. If those at higher risk of morbidity and mortality from COVID-19 take greater precautions, levels of hospital

⁴ [The World Health Organisation recommended using letters of the Greek alphabet when referring to SARS-CoV-2 variants](#). Current variants of concern labelling stands as B.1.1.7 as Alpha, B.1.351 as Beta, P.1 as Gamma, and B.1.617.2 as Delta.

admissions and deaths could be lower than those seen in the Roadmap modelling in comparison with cases.

- *Vaccine effectiveness estimates* continue to be refined and some estimates⁵ suggest this is lower in older age groups and the vulnerable. If found to be true, this would need to be included in the models' structures.
- There is now *evidence of waning vaccine effectiveness*^{5,6}, particularly 140 days after the second dose; this was not considered in most scenarios conducted before Step 4 was taken. Those individuals vaccinated in late 2020 and early 2021 will have less protection in the coming months, an issue exacerbated by lower effectiveness in those individuals who may be older or vulnerable as already discussed, many of whom were vaccinated in this period. Third doses and booster vaccinations, which are able to reverse waning of protection, will limit the impact of waning immunity.

18. It will take a further three to four weeks for the full impacts of likely forthcoming changes in behaviour to be reflected in the data, such as the return of schools in England and any reduction in working from home. Over the same time frame, further evidence may emerge on the duration of immunity. Several policy areas are also likely to become clearer, including: advice from the Joint Committee on Vaccination and Immunisation (JCVI) on booster vaccinations, UK Chief Medical Officers' advice on vaccination of those aged 12 to 15, and the final shape of government policy on certification for access to some venues. Over a slightly longer timeframe, the impact of the return of higher and further education will also need to be considered.

19. With the current levels of high prevalence combined with unknown behaviours, the burden on health and care settings could rise very quickly. If acute COVID-19 combines with other pressures, such as Long COVID, other infectious diseases (influenza, RSV, norovirus, etc.), or co-infection of SARS-CoV-2 with other diseases increases morbidity, it could be a very difficult winter ahead.

20. The actual epidemic trajectory over autumn and winter will depend on whether contact patterns continue to increase at the same rate; it is quite possible that any future scenarios may be ruled in or out quite rapidly. While the longer-term trajectory cannot be modelled with certainty, it is possible to look at a plausible selection of projection scenarios over the next eight weeks.

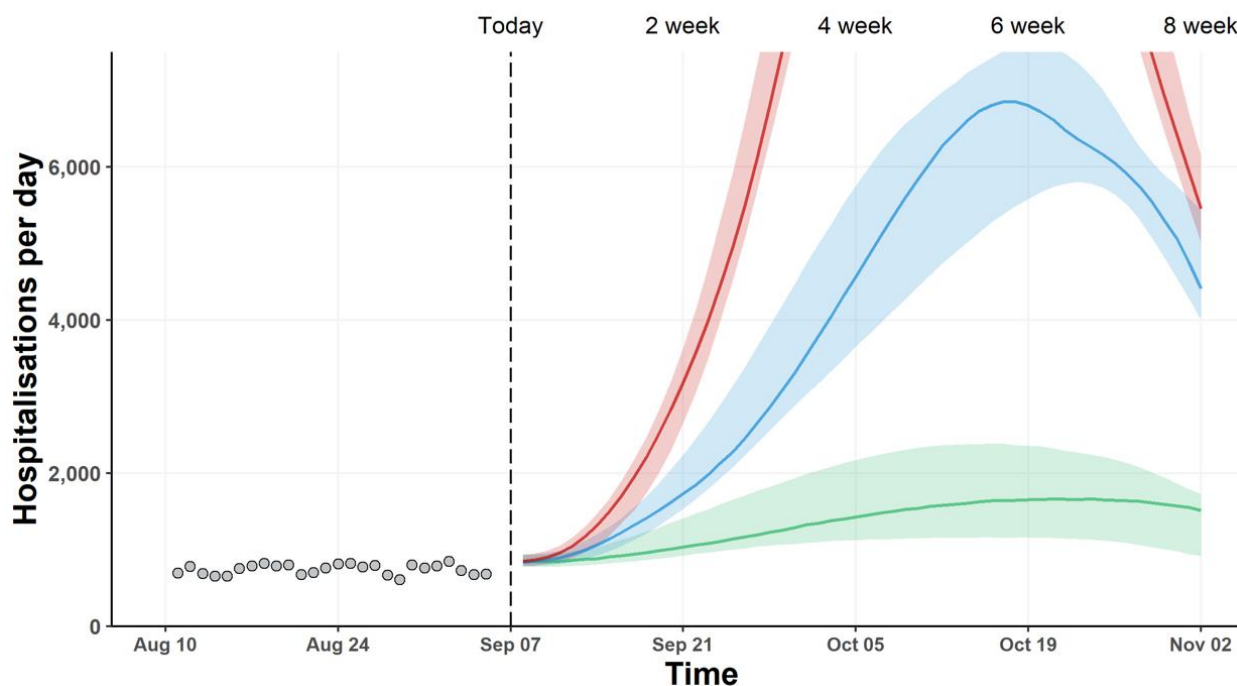
⁵ Public Health England Vaccine Effectiveness data (SAGE 95)

⁶ [Impact of Delta on viral burden and vaccine effectiveness against new SARS-CoV2 infections in the UK](#)

Medium-term projections and scenarios

21. Each week, SPI-M-O combines estimates from several independent models to project the trajectory of the epidemic **if no further changes in behaviour or policy take place** (other than school holidays). Waning immunity is not considered. The projections represent what the trajectory might be if the epidemic continued to follow the trends seen in the latest available data up to 6th September. **They are neither forecasts nor predictions** and cannot fully reflect recent changes in transmission that have not yet filtered through into surveillance data. They are released separately as SPI-M-O medium-term projections.
22. Four of these same models have further been used to explore the potential impact of a range of scenarios following changes in transmission. These scenarios assume changes in behaviour result in R values of 1.1, 1.5, or 2.0 on 6th September⁷, and are run for a further eight weeks. These scenarios are shown in Figure 1 (R=1.1 – green; 1.5 – blue; 2.0 – red) for England’s hospital admissions.

Figure 1: Eight-week scenarios for daily hospital admissions in England over a range of effective R values (1.1 – green; 1.5 – blue; 2.0 – red) reflecting the possible impact of increased contacts from 6th September. All scenarios show interquartile ranges of model combinations as the shaded band.



23. SPI-M-O deems the scenario where $R = 2.0$ (red) to be an extreme trajectory for the epidemic over the next few weeks; it is a *possible* outcome, but highly unlikely. A scenario of this scale might be more likely were waning immunity to play a greater role (see paragraph 17 above) or if a new variant of concern were to emerge. In contrast, a scenario

⁷ In each of these scenarios, R drops over time after 6th September as vaccination and infection reduce the number of people who remain susceptible.

of $R = 1.1$ (green) is much more possible through a range of many different situations. This range of R values, however, is not dissimilar to those seen for cases in Scotland in recent weeks.

24. The two scenarios of $R = 1.1$ and $R = 1.5$ attempt to provide an envelope which contains the likely epidemic trajectory over the next couple of months. Even in the $R = 1.1$ scenario, a large number of COVID-19 hospital admissions (up to around 2,000 a day) in England for a potentially protracted period of time is projected. Due to the uncertainties already discussed, it is not possible to project more accurately or further into the future. If combined with other winter pressures or seasonal effects; this could lead to a difficult few months for the health and care sector.

Steps to curb epidemic growth

25. Hospital occupancy in England is currently around 6,200, which is only two and half doubling times away from the peak seen in January 2021 of 34,000. Given the scope for increased transmission after the end of the school holidays, and recent events in Scotland (where hospital occupancy has doubled in the 13 days to 7th September), SPI-M-O has considered how and when steps may be taken if there is sustained growth in hospitalisations in England.

Warning signs

26. While the relationship between cases and hospitalisations has changed due to vaccination, increasing cases remain the earliest warning sign that hospital admissions are likely to rise. The age distribution of cases is very likely to change over the short-term with the return of children to schools and so the number of cases in older people is of particular importance. Increasing positivity (from ONS) would indicate that rising prevalence would likely be the reason for increasing cases, rather than changes in test-seeking behaviour.
27. As discussed previously, it is critical that the vaccine status of hospital patients is monitored and reported in real time to detect clusters of admissions that may be the result of a novel variant.

Timing of interventions

28. It remains the case that the earlier that interventions are brought in, the lower prevalence is kept, reducing the direct COVID-19 burden and reducing the risk of needing more stringent measures to quickly reduce transmission (and hence prevalence). A basket of measures, light enough to keep the epidemic flat, would be sufficient if enacted when hospitalisations were at a manageable level. If the epidemic were allowed to continue to

grow until hospitalisations were at a level that needed to be rapidly reduced, much more stringent (and therefore more disruptive) measures would be needed to bring prevalence down quickly.

The nature of interventions

29. The measures and behaviour in place at present have been sufficient to keep R around 1 over the summer, while schools were on holiday, many people continued to work from home, and with summer weather and current population immunity levels.
30. There is a clear consensus that the continued high level of homeworking has played a very important role in preventing sustained epidemic growth in recent months. It is highly likely that a significant decrease in homeworking in the next few months would result in a rapid increase in hospital admissions.
31. If enacted early enough, a relatively light set of measures could be likely be sufficient to curb sustained but slow growth. As well as encouraging home working, more light touch measures could include clear messaging that recommends people acting cautiously, more widespread testing, a return to requiring all contacts of cases to isolate, and more mask-wearing.
32. Given a high proportion of susceptible people are in younger age groups, measures targeted towards them are likely to have a disproportionately large effect on prevalence.
33. There was no consensus on the strength of measures that could be needed if the growth rate were high and the number of hospitalisations needed to be reduced rapidly. During a period of sustained epidemic growth, the more stringent the measures introduced (or the more rapid the decline in the epidemic that could be achieved), the shorter the duration needed for the measures to be in place to reach a given prevalence.
34. SAGE has also previously highlighted considerations as to what measures may be required to control transmission in different situations⁸.

⁸ [EMG, SPI-M and SPI-B: Considerations in implementing long-term 'baseline' NPIs](#); SAGE 87 22nd April 2021