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

Date: 19th May 2021

All probability statements are in line with the framework given in the Annex.

Summary

1. SPI-M-O's best estimate for **R in England is between 0.9 and 1.1**. **R is estimated to be between 0.9 and 1.2 for Scotland, 0.8 and 1.0 for Wales, and 0.7 and 1.1 for Northern Ireland**. These estimates are based on data available up to 17th May, including hospitalisations and deaths as well as symptomatic testing and prevalence studies.
2. The epidemic in England is very heterogeneous, with rapid growth in some local authorities and continued gradual decreases in others. Many, but not all, of the local authorities with high growth rates also have a high proportion of samples which are S-gene positive. SPI-M-O's estimated range for R is highest in the North West of England, between 0.9 and 1.2.
3. R estimates are averages over populations, viral variants, and areas. The combination of clustered outbreaks in some areas and declines in others means the estimates are difficult to interpret and less reliable than usual. The situation could change quickly in the coming days, especially as restrictions were relaxed further on 17th May.
4. SPI-M-O estimates that there are between **1,000 and 6,000 new infections per day in England.**
5. SPI-M-O remains concerned about the increase and spread of cases of the B.1.617.2 variant in some localities of England and Scotland. The latest week's data are consistent with SPI-M-O's assessment from 12th May that **B.1.617.2 has a significant growth advantage over the UK's currently dominant strain, B.1.1.7, and it is a realistic possibility that this could be 50% more**; at the moment, the available evidence does not allow SPI-M-O to provide a more confident estimate of the extent of the growth advantage. The situation remains highly uncertain and, despite more data and further investigation from a variety of aspects, concern is building.
6. The inherent lags between infections, cases, testing, sequencing, and any subsequent need for healthcare means it is not possible to know how B.1.617.2 is spreading **now**. Current data suggest that trends have not changed since last week with continued growth, albeit cases and hospitalisations remain at a relatively low base, and some new areas are becoming concerning.

Incidence and prevalence

7. Combined estimates from six SPI-M-O models, using data available up to 17th May, suggest there are between **1,000 and 6,000 new infections per day in England.**

8. During its most recent week (9th to 15th May), the ONS community infection survey estimates that an average of **49,000 people had COVID-19** in the community in England (credible interval **38,800** to **60,300**). The survey does not include people in care homes, hospitals, or prisons. Two confirmed B.1.617.2 infections were also detected in the four weeks up to 9th May, indicating its increasing prevalence. Estimates from across the four nations of the UK are:

England	49,000 (credible interval 38,800 to 60,300)
Scotland	2,700 (credible interval 1,000 to 5,200)
Wales	700 (credible interval 100 to 2,000)
Northern Ireland	1,200 (credible interval 300 to 2,900)

Growth rate and reproduction number

9. For small daily changes, the growth rate is approximately the proportion by which the number of infections increases or decreases per day, i.e. the speed at which an epidemic is growing or shrinking[1].

10. SPI-M-O's consensus estimates for the **growth rates in the four nations are:**

    England is between **-2% and +1% per day**,
    Scotland is between **-3% and +2% per day**,
    Wales is between **-4% and 0% per day**, and
    Northern Ireland is between **-5% and 0% per day**.

    SPI-M-O's national and regional estimates of growth rates are summarised in Table 1 and Figure 3.

11. The reproduction number (R) is the average number of secondary infections produced by a single infected individual; it is an average over time, geographies, viral variants and communities. This should be considered when interpreting the R estimate for England, given the current local heterogeneity in epidemiological situations.

12. SPI-M-O's best estimates for **R in England is between 0.9 and 1.1**. **R is estimated to be between 0.9 and 1.2 for Scotland, 0.8 and 1.0 for Wales, and 0.7 and 1.1 for Northern Ireland**. SPI-M-O's agreed national estimates are summarised in Table 1 and Figure 2, and these are based on the latest data available up to 17th May. R is an indicator that lags by two to three weeks and therefore does not reflect the full impact of behavioural

[1] Further technical information on the growth rate can be found in Plus magazine

changes that have happened during this time. Regional estimates can be seen in Table 1 and Figure 4.

13. Overall, the epidemic in England could be either flat, shrinking slowly, or growing slowly. The epidemic in England is very heterogeneous, with rapid growth in some local authorities and continued gradual decreases in others, most are indistinguishable from flat. Many, but not all, of the local authorities with high growth rates have a high proportion of samples which are S-gene positive.

Table 1: Combined estimates of R values and growth rates in the four nations of the UK and NHS England regions (90% confidence interval)[2]

Nation	R	Growth rate per day
England	0.9 to 1.1	-2% to +1%
Scotland	0.9 to 1.2	-3% to +2%
Wales	0.8 to 1.0	-4% to 0%
Northern Ireland*	0.7 to 1.1	-5% to 0%
NHS England region	**R**	**Growth rate per day**
East of England	0.8 to 1.1	-3% to +2%
London	0.9 to 1.1	-2% to +2%
Midlands	0.8 to 1.0	-3% to 0%
North East and Yorkshire	0.8 to 1.0	-3% to 0%
North West	0.9 to 1.2	-1% to +3%
South East	0.8 to 1.0	-4% to 0%
South West	0.8 to 1.1	-4% to +1%

14. R estimates are averages over populations, viral variants, and areas. The combination of clustered outbreaks in some areas and declines in others means the estimates are difficult to interpret and less reliable than usual. The situation could change quickly in the coming days, especially as restrictions were relaxed further on 17th May.

15. Some data streams may not be representative of the current situation due to low prevalence; community based swabbing studies, such as ONS COVID-19 infection survey and Imperial College London's REACT, become quite difficult to interpret or use for model fitting when the prevalence is very low and patchy.

[2] The estimated intervals for R and growth rate may not exactly correspond to each other due to the submission of different independent estimates and rounding in presentation.
* Particular care should be taken when interpreting these estimates as they are based on low numbers of cases, hospitalisations, or deaths and / or are dominated by clustered outbreaks and so should not be treated as robust enough to inform policy decisions alone.

S-gene positivity and variants of concern

16. SPI-M-O remains concerned about the increase in and spread of cases of the B.1.617.2 variant in some localities of England and Scotland. The latest week's data are consistent with SPI-M-O's assessment from 12th May that **B.1.617.2 has a significant growth advantage over the UK's currently dominant strain, B.1.1.7, and it is a realistic possibility that this could be 50% more**; as yet, the available evidence does not allow SPI-M-O to provide a more confident estimate of the extent of the growth advantage.

17. Whilst there are clear observations that B.1.617.2 is transmitting very fast in some places, numbers are still low and SPI-M-O cannot yet tell whether that pattern will be repeated across the whole population; these early growth rates are confounded by a range of other biological, virological, and epidemiological factors, as well as stochasticity, making attributing what is causing said growth difficult. Unfortunately, it will not be known whether the growth advantage seen in current cases applies to the whole population until infection is widespread. For example, in the last few days the speed of growth in cases in some areas has been slightly slower than it has been recently. This could be due to stochastic events, early enhanced spreading events, changes in testing patterns, or saturation of the networks in which B.1.617.2 has been circulating most rapidly. Growth rates of B.1.617.2 seem to differ between areas and, as yet, the reason for this is not known.

18. Growth in sequenced B.1.617.2 cases continues to track increases in S-gene positivity that have been previously discussed[3].

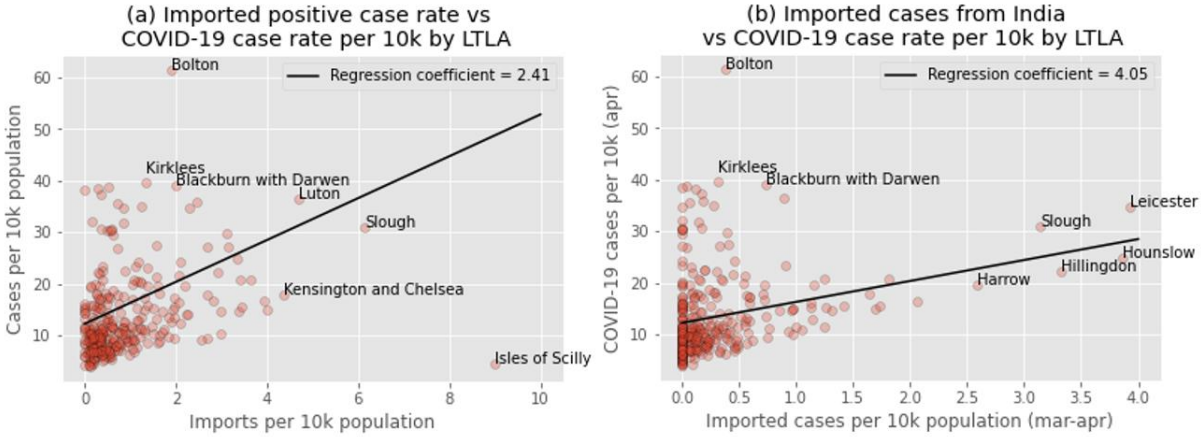
19. Last week, an assessment from one modelling group focusing on B.1.617.2 and the UK as a whole estimated that R was approximately 1.64 (95% CI: 1.61 to 1.67)[3]. An updated analysis including recent data using this approach estimates that returning traveller cases were contributing more secondary cases on average (3.3 secondary cases; 95% credible interval of 1.8 to 10) than non-travellers (1.7 secondary cases; 95% credible interval of 1.5 to 1.8). Transmission in non-travellers with an R=1.7 in this analysis corresponds to a median doubling time of 7.1 days for B.1.617.2 since 1st May 2021.

20. Investigations by another group on the geographical distribution of inbound positive cases from India into the UK consider the correlation between case rates in lower tier local authorities (LTLAs) and the estimated rate of importations from India or from all countries combined per 10,000 population. Bolton appears as an apparent outlier in both analyses, with high case rates not explained by corresponding importation rate from India (Figure 1). The additional cases may be due to any combination of established local transmission

[3] SPI-M-O: Consensus statement on COVID-19; LSHTM: Modelling importations and local transmission of B.1.617.2 in the UK; SAGE 89 13th May 2021

within Bolton, transmission from other UK locations, or importations from countries other than India. On one hand, this suggests that relatively few communities have had large outbreaks despite large influx. On the other hand, it suggests that transmission within the UK is driving the current pattern.

Figure 1: Linear regression plots for imported cases from all countries (left) or India (right) against SARS-CoV-2 case rates by lower tier local authority (LTLAs; red dots) between 1st March and 12th May 2021. The linear regression coefficient for (a) is 2.41 (p<0.001) and for (b) is 4.05 (p<0.001). There remain several LTLAs which have experienced high case rates despite limited importations.



21. Using linked data from testing, vaccination status, and hospitalisation from Public Health Scotland has allowed analysis of cases by S-gene status and hospitalisation. While these involve very small numbers, early evidence suggests those vaccinated are less likely to be admitted to hospital. While the hazard ratio of hospital admission increases with age, this is not as steep as before vaccination. There is currently little to no evidence of a substantially higher risk of hospitalisation for those infections that are S-gene positive.

22. SPI-M-O have previously advised that they would become more confident in its estimate of growth advantage if any of these four possible situations were to arise. Any of these could happen extremely quickly, potentially even within days. As yet, there is no clear evidence that any have occurred:
    - Any emerging evidence of vaccine escape, such as more S-gene positive cases than expected in vaccinated people.
    - More rapid increase in hospitalisations in areas with high or rising S-gene positivity compared to elsewhere, or higher than expected levels of B.1.617.2 cases in hospital.
    - Other parts of the country reflecting similar situations to the North West cluster that cannot be easily identified as being linked to either that cluster or travel.
    - If the North West cluster has another consistent doubling at the same speed (i.e. less than one week).

23. The situation remains highly uncertain and, while SPI-M-O cannot be more confident in its estimate of growth advantage, despite more data and further investigation from a variety of aspects, concern is building. The inherent lags between infections, cases, testing, sequencing, and any subsequent need for healthcare and the incompleteness of S-gene target coverage all mean it is not possible to know how B.1.617.2 is spreading **now**. Current data suggest that trends have not changed since last week with continued growth, albeit cases and hospitalisations remain relatively low, and some new areas are becoming concerning, such as Hounslow.

24. It may not be possible to know the likely widespread impact of B.1.617.2's growth advantage until it is too late to prevent a large resurgence; this cannot be ruled out from the data that is currently available.

Increased transmissibility and immune escape impacts on Roadmap progress

25. SPI-M-O considered the implications of variants of concern with different characteristics in modelling to support Roadmap Step 3 decision making[4]. Further sensitivity analyses have been conducted by Warwick, Imperial College London, and London School of Hygiene and Tropical Medicine (LSHTM) for putative variants of concern that have increased viral transmissibility or immune escape, under varying levels of transmission due to non-pharmaceutical interventions after Step 4 is taken. That modelling considers the implications of variants of concern with growth advantage that is solely a biological property of the virus and so pertains across the entire population.

26. All three groups find that for a high but plausible viral transmission advantage (50%, 60%, and 75% more transmissible than B.1.1.7) for a dominant novel variant, even without immune escape, leads to a further large resurgence in hospital admissions that would be a similar size to that seen in January 2021 following Step 3 alone.

27. With a more modest viral transmission advantage (10% and 25% more transmissible than B.1.1.7), the resurgence after Step 3 is smaller but still substantial. In such a situation, if Step 4 is then taken, the maintenance of a significant reduction in transmission as a result of baseline measures and behaviour changes after Step 4 can avert another wave of hospital admissions on a scale similar to those seen in spring 2020 and January 2021.

[4] SPI-M-O: Summary of further modelling of easing restrictions – Roadmap Step 3; University of Warwick: Roadmap scenarios and sensitivity – Steps 3 and 4; LSHTM: Interim roadmap assessment – prior to Steps 3 and 4; Imperial College London: Evaluating the Roadmap out of Lockdown – Step 3; SAGE 88 5th May 2021; SPI-M-O: Consensus statement on COVID-19; SAGE 89 13th May 2021

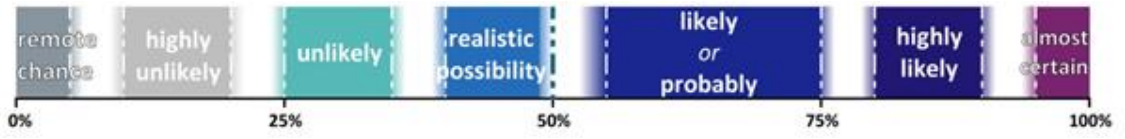
28. Further sensitivity analyses on these scenarios suggest transmissibility and vaccine- or immune-escape are much greater determinants in resurgence size at the whole population level than other factors, such as vaccine roll out speed.

Surge vaccination

29. SPI-M-O has previously considered the merits of surge vaccination[5]. Preliminary modelling by two groups suggest that prioritising vaccination to those populations with highest incidence of a new variant has the potential to reduce the peak incidence locally by up to 50% and reduce incidence nationally. Both models assume a fixed national vaccination capacity, such that spatially targeted vaccination reduces vaccination in other areas. Despite this, the overall benefit can be large, especially if local control depresses national spread.

30. The Joint Committee on Vaccinations and Immunisations (JCVI) considers all these data and inputs in making their decisions. This is presented as one modelling input for JCVI to consider and SPI-M-O recognises that there are several other inputs they need to take into account, including the latest data on vaccine effectiveness of one or two doses of vaccine against any new variant and the operational realities of delivering the vaccine programme.

Annex: PHIA framework of language for discussing probabilities



[5] SPI-M-O: Consensus statement on COVID-19; SAGE 89 13th May 2021

Figure 2: SPI-M-O groups estimates of median R in the four nations of the UK, including 90% confidence intervals. Bars represent different independent estimates. The grey shaded areas represent the combined numerical range and the black bars are the combined range after rounding to 1 decimal place.

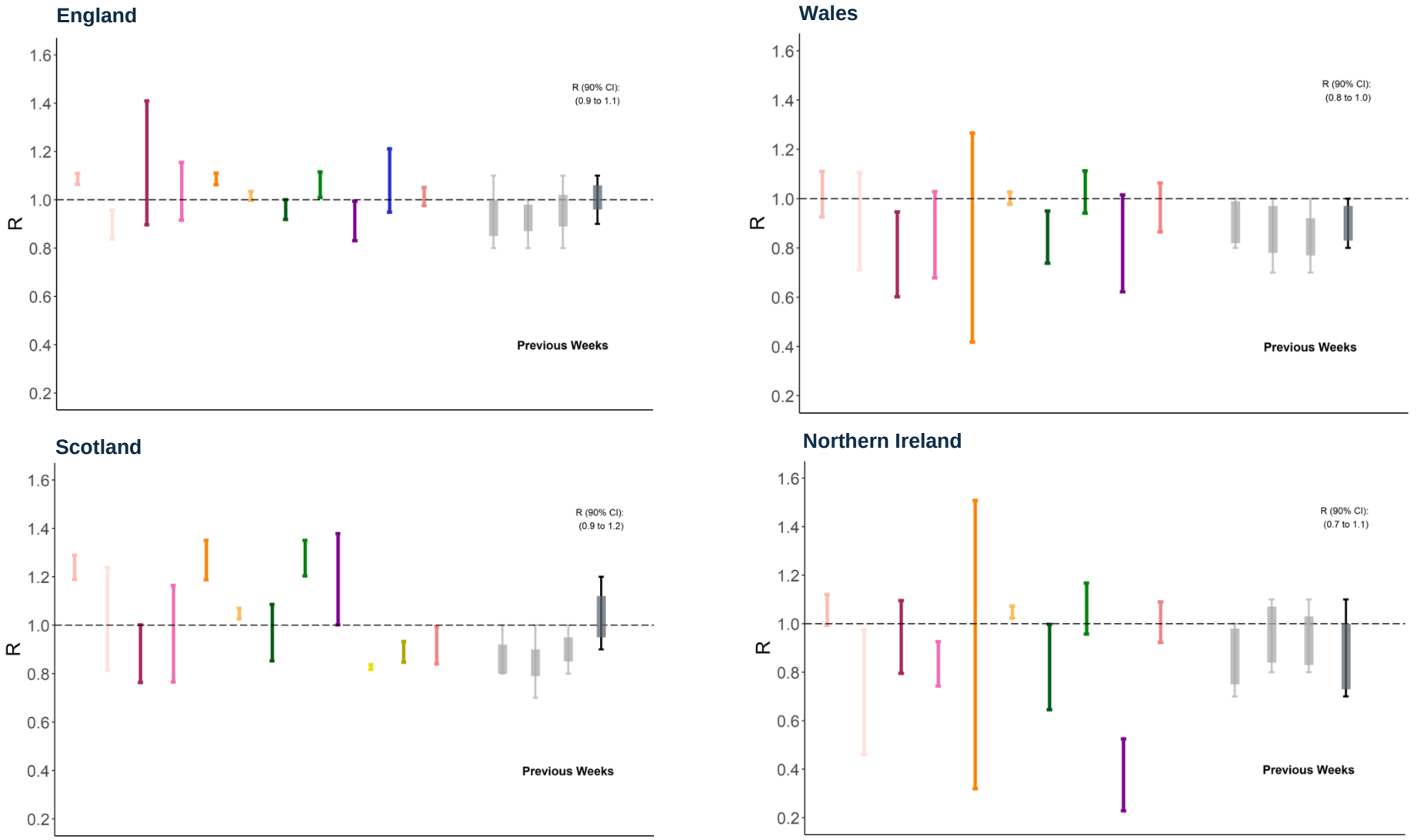


Figure 3: SPI-M-O groups' estimates of the growth rate in NHS England regions, including 90% confidence intervals. Bars represent different independent estimates. The grey shaded areas represent the combined numerical range and the black bars are the combined range after rounding to 2 decimal places.

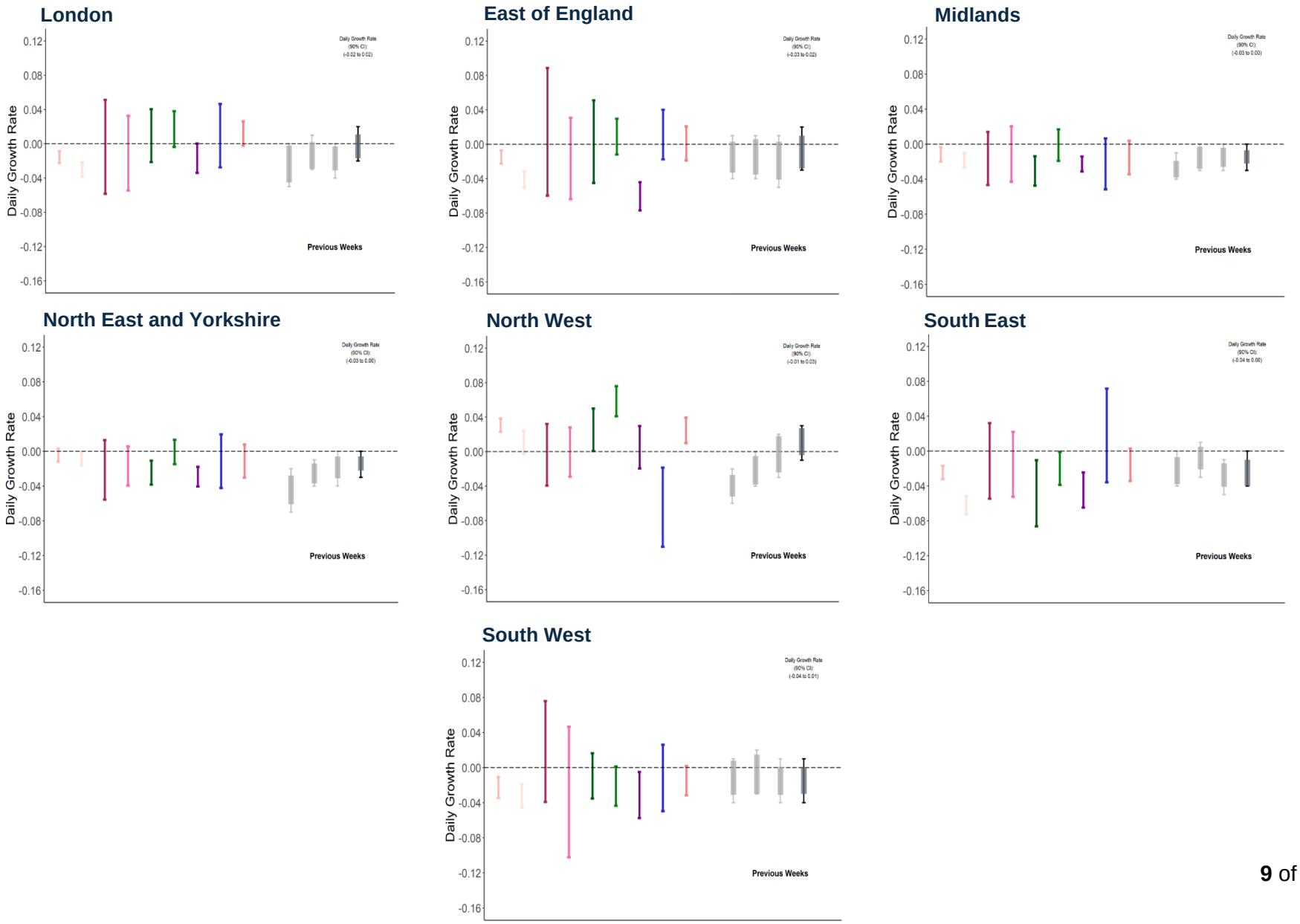


Figure 4: SPI-M-O groups' estimates of median R in the NHS England regions, including 90% confidence intervals. Bars represent different independent estimates. The grey shaded areas represent the combined numerical range and the black bars are the combined range after rounding to 1 decimal place.